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GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

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VOL. CXXXVII., No. 2805.] TUESDAY, FEBRUARY 13, 1917. [69TH YEAR.

EDITORIAL NOTES.

Benzol Recovery—Are Gas Undertakings Doing their Fair Share?

THE answer, speaking of gas undertakings in the aggregate and not individually, must be in the negative. This is said confidently, not only from observation and general knowledge of what is being done, but from available approximate data. Those gas-works that are tar-washing their gas for the recovery of crude benzol are not achieving what they might by oil-washing; nor are some of those who are oil-washing doing their maximum best. And proprietors of those gas-works that are neither tar-washing nor oil-washing are—providing there is no genuine obstacle to their taking up the work—in a position that, in the circumstances, is nothing short of contemptible. These plain, well-known facts alone are conclusive that the gas industry is not supplying its "fair share" of crude benzol that the country and its Allies require in increasing quantities.

There are two main sources of crude benzol—the coking industry and the gas industry; and comparing approximate data as to their respective outputs, the disparity between them, in favour of the former and against the latter, is anything but creditable to the gas industry, in view of the relative amounts of coal carbonized. The only possible thing that can be said in defence is that the gas industry (with few exceptions) took up quite a new process in the washing of their gas for benzol recovery for the relief and assistance of the country in the great emergency; while the washing of gas for the extraction of benzol was already a process in settled and daily practice in the coking industry. But this "defence," so far as it goes, weakens as the days pass; for it cannot with truth be submitted that the gas industry generally is doing its utmost, nor are some undertakings showing any disposition in that direction. The greater the credit and honour to those concerns that are doing their best; and in this class the Gas Light and Coke Company may be placed as leader, and fitly so, as the premier gas company in years and magnitude.

But as to the data. According to the Board of Trade returns, the quantity of coal carbonized by statutory gas concerns in 1914-15 was 16,684,087 tons—nearly 300,000 tons less than in the preceding peace year. But matters have changed since then. Owing to the difficulties and price of oil, it is probable that not far short of 17 million tons of coal are at the present time being carbonized by the statutory concerns; seeing that though some have lost consumption through the lighting restrictions, others have more than counterbalanced this through increased industrial demand. To the 17 million tons probably another 1½ millions might be placed for non-statutory gas undertakings. Then regarding the coking industry, in his Royal Institution lectures last year, Prof. W. A. Bone, F.R.S., the Chairman of the Fuel Economy Committee of the British Association, stated as a deplorable fact that, of 20 million tons of coal carbonized in coking plants in the year 1913, no less than 6½ million tons were treated in beehive ovens, which left 13½ million tons to be dealt with by bye-product plants. We know that the coking plants of the country have been very busy in producing metallurgical coke for use in the making of munitions. But, nevertheless, the plants cannot have been materially extended. Anyway, the quantity of coal carbonized by gas-works is, the figures show—the computed 18½ million tons, compared with the 13½ millions—considerably in excess of that carbonized in bye-product coking plants, from which (Prof. Bone said) from 2 to 3½ gallons of crude benzol, &c., are recovered per ton of coal. The coal figures give roughly the relative capacity of the two industries for crude benzol recovery; but what is the actual position to-day in point of relative delivery of crude benzol for satisfying the requirements in the terrible, devastating, and far-reaching war? It is that gas-works, through the oil and tar washing of gas and ordinary untreated tar, are supplying one-third of the total output of crude benzol, while the bye-product coke-ovens are furnishing two-thirds, with (accepting Prof. Bone's quantity) their smaller carbonization of coal. In passing, it may, however, be noted that the coke-oven tar does not produce any appreciable amount of carbolic crystals—a substance of extreme value at the present time. The one-third and two-thirds of crude benzol are approximate proportions. But in respect of them the gas industry does not stand so well as we should like to see it, and as those in official place, whose days are strenuous in working to secure greater supplies of explosives material, could desire to see.

In view of the figures so far given, we repeat the question, Are gas undertakings doing their fair share in the provision of the necessary crude benzol in the gravest of national crises? It can be said without fear of any denial—the facts are too substantial for denial—that they are not. Let us quote further figures to make the case still more complete. There are 700 to 800 works to-day with tar-washing plants in existence. Within the extraction limits of such plant, some works are doing well, while others are not, and other undertakings might just as well not have the plants on the works for all the good that is being done with them, through indolence or heedlessness in their working. Where tar-washing is seriously carried on, the benzol and toluol results are not to be despised; but if the country had depended upon tar-washing by gas-works, the results, added to the other available supplies, would have been totally inadequate. This indicates the gravity of the position, which has caused those in highly responsible places to evince so much anxiety—and to be constantly pleading—for the installation of oil-washing plants on gas-works. Of course, the difference between the outputs of gas-works and bye-product coking plants will be lessened with time; but the rate of progress of the lessening is deplorably slow. The enthusiasm with which some gas men early entered into the practice of oil-washing, and have conquered difficulties at the incipient stages, does not seem to be possessed to anything like the same degree by many of their professional compeers. The result of this is that at the present time only some eighty gas-works are oil-washing. Additional oil-washing plants, however, are being erected; and these, with promises to adopt such plant, will, it is hoped, before long raise the number to 150. There will then remain something like 700 works still using the comparatively inefficient tar-washing plant. If a greater number of these would take up the oil-washing process, not only would the gas industry approach nearer to the producing position of the coking industry, but—and this is the point that really matters—it would be serving with greater effect in the work of winning the war. And not only so, it would be adding to the security of the country in the provision of explosives for any possible emergency. This is a case in which it is better to have too much in hand, than to encounter a set-back through a shortage or some other unexpected cause. Those placed in favourable positions in any respect have their obligations; every gas undertaking has its obligation in connection with this war. Let the obligation be fulfilled.

The Heavy War Burden, and an Increase in Price.

JUST as in the war the summit of intensity is now being approached, so we believe the heaviest weight of the war burdens upon gas undertakings has now to be borne. For such concerns, the conditions, with their environment of uncertainty, have been critical all through the period of the war; and it will be some consolation to think, in encountering the now inevitable worse circumstances in regard to raw material and labour, that from the highest point of tension for all concerned, we shall begin to move, slowly it may be, down the incline to the plane of new normal conditions. But no one can yet say how long the imminent sterner state of affairs will continue. This will depend entirely upon the length of the war climax; and, therefore, the provision the gas industry has to make for these days is an unknown quantity, which must for safety be on a generous scale.

Extremes afford emphatic illustration of conditions. The Gas Light and Coke Company supplies emphasis of the effects of current conditions through the extreme position it occupies in the magnitude of its operations, supplemented by heavy capital obligations—a legacy from the past—which the late Governor (Sir Corbet Woodall) and his directorial colleagues, with the Managing Director (Mr. D. Milne Watson) and the Engineer (Mr. Thomas Goulden), have constantly worked hard to lighten. The accounts of the Company for the past half year were reviewed by us a fortnight since; and the Governor (Mr. John Miles), in addressing the proprietors last Friday, quoted some of the huge figures to show what the administration of the Company has had to contend with. In nearly every direction of principal outlay—coal, oil, freights, labour, repairs and maintenance (owing to the enhanced costs of materials and labour), and in less degree in other quarters—costs have mounted up to such an extent that the increases (the increases only be it marked) of the working expenses total to £435,000 in the six months! Putting in another way the advances that have had to be encountered, since the beginning of the war coal has advanced in price by 50 p.ct., coal freights by 400 p.ct., and oil (including freights) by 300 p.ct., which item is going to be increased by at least another 100 p.ct. These are graphic numbers. The war bonus to the weekly employees and the allowances to women workers (now numbering something like 1100) and the lower salaried staff officers are together costing considerably more than a quarter of a million of money a year, or, to be exact, £275,000, which is equal to 2d. per 1000 c.ft. of gas sold. Employers and employees have reciprocal obligations. Humane considerations alone dictate this huge additional expenditure, in order to give partial relief to the workers from the severity of the grip of the current circumstances of life; while, on the other hand, the employees have their obligations in assistiug by good and full work in producing, in the common interests, as much relief as possible for the Company from the iron grip of prevailing conditions under which the business is being anxiously conducted. That the Gas Light Company's men and women have well responded to duty had high recognition from both the Governor and Mr. Goulden. In the absence of nearly 4000 men on military service, observed the latter, the men have been called upon to handle an extra 60,000 tons of coal in the past half year; and there has been extra strain this last month, with the wintry weather pushing the consumption by 19 p.ct. above that of January, 1916. The testimony could be applied to all the other departments, with an increased business doing —more especially the distribution and sales departments, the latter of which has had to meet a considerable demand for new appliances, including the enlarging requirements for industrial applications, as well as to connect-up an increasing number of consumers.

However, in the face of these conditions, and the special circumstances of the Company, a further increase has to be made in the price of gas, the amount of which has yet to be determined. The existing price of 3s. north of the river is only 20 p.ct. above the pre-war price; and when the consumers compare this with the percentage increases in costs already quoted, and consider, too, the measure of the monetary relief extended to employees (which is a magnificent set-off to their loss under the co-partnership scheme), as well as the slender dividend the proprietors are receiving, and which will be subject to further reduction on the additional increase of price, they will sympathize rather than complain. If it had been possible in any way that was prudent to continue at the current price, the Directors would not have taken this step; seeing that the interest of every proprietor, under the sliding-scale of price and dividend, lies in the contrary direction. By all concerned, however, it may with very fair hope be taken that the increase will be but temporary, to enable the concern to pass, and to maintain its financial integrity, over what is confidently believed will be the highest point in the intensity of the conditions which have been produced for the Company, as for other gas undertakings, by this terrific war.

National Gas Council and Men for Military Service.

THE time is now approaching when gas engineers will be confronted with the question of a further "combing-out" of the workmen employed in the gas industry; and, in view of the difficulties already assailing the industry in regard to labour, the prospect is not being viewed with any of the pleasantest feelings. The National Gas Council have been working unremittingly in this matter, on behalf of the industry, in conference and negotiations with the Government Departments who are omnipotent in this connection. But we are afraid there are many managements of gas undertakings who fail to appreciate that—the work of the Council being of incalculable importance to the industry, and of a purely honorary character, absorbing much time, and claiming a great deal of anxiety, thought, and deliberation—there is a responsibility upon those for whom the Council are working to actively help them, and not to render their work less effective than it might be, through sheer indifference and negligence. In November last, the Council issued a circular inviting particulars as to further possible recruiting in the gas industry; and we do not now like to read the opening clause of the following passage in the report which they have issued, and which is published in other columns this week: "The information received from "*such of the undertakings as replied* has been dealt with in "consultation with the Ministry of Munitions, and in many "cases assistance or advice that has proved of value has "been given by the Council." The italicized words indicate that not a small number of the undertakings that received the circular did not even condescend to reply to it; and yet there will, we venture to say, be no hesitation on the part of those concerned to utilize to the full the results of the conferences and negotiations that have been bestowed upon this matter by the Council in the interests of the industry generally. The work of the Council is not for the few; it is for the common good of the industry. And such work surely claims the loyal support of every constituent undertaking.

The principal matter dealt with in the report is this important one for the industry as to the future of certain of its workers; and it may at once be said that, as a result of the conferences that have taken place, we believe there need be no undue anxiety on the part of gas managers. "Undue" is used advisedly, as the position cannot be regarded as altogether satisfactory, and absolutely free from obscurity. Men are required for the Army. It is a matter of first importance. The realization of the last ounce of efficiency in any industry must take a secondary place; and there must be an enconomizing of labour, and a reduction to the bare essential point. This is the position to be kept prominently in view; it is the position that, with all the sympathy of the Ministry of Munitions and the assistance of that Department with the military authorities, makes it impossible for the National Gas Council to submit to the industry a cut-and-dried scheme in relation to the matter. What they have been able to effect with the authorities is rather of an educative nature as to the position of the industry as an essential one not only to the community but to the provision of explosives and other materials indispensable to the prosecution of the war. If these are indispensable, then so are the men who provide them; and the men who provide them are not only the men engaged in and about oil or tar washing and distillation plants, but all men who contribute in any way to the production and disposal of the gas which is the subject of the washing. This seems to us to be the point over which, other than the Ministry of Munitions, the authorities who have to deal with the question stumble, or else they do not sufficiently appreciate it. The fault for this is not due to the efforts made to put the position clearly; but it may be due to the resistance of the military authorities to commit themselves to any pledge until the proper tribunals have again investigated the man

position of every industrial undertaking. In the circumstances, we cannot blame them for their attitude.

What the Council have done, however, has been to secure, and to bring together, certain general principles of which use may be made by each individual undertaking in protecting its interests within the limits of what can be proved to be positively necessary. But there can be no strict definition, and no classification that is unambiguous. It is seen, for example, that though, in connection with the de-badging order, a classification of skilled, semi-skilled, and unskilled men has been agreed upon between the Ministry of Munitions and the Council, it is only of a "temporary" nature, and that the Ministry are going to issue further instructions to individual undertakings with whom it is proposed to deal on a uniform basis by a special staff of the Ministry. There is no certainty there. Then, again, the Council have impressed upon the authorities the need for particular types of men for particular classes of work; and the Council are convinced that the matter of enabling the industry to carry on its essential work is undoubtedly fully realized by the authorities. This is a distinct gain, but still uncertainty again comes in. It has been intimated that there is no intention to deprive gas undertakings of the "minimum of "labour" essential to the carrying on of their work, but that undertakings must co operate readily with the authorities in the work of substitution. The determination of the "minimum labour" for any gas undertaking will not be an easy matter which can be performed to a nicety, as no rule can be applied by the authorities such as the number of men allowable per unit of gas output. The minimum number depends upon the individual circumstances both in relation to the efficiency of the men themselves and the character of the plant. The provision of "suitable substitutes" comes in to complicate the position, seeing that the substitute is not likely in most cases to possess the same efficiency as the man displaced, Who, too, is to determine the suitability of the substitute? The military authorities will hardly be prepared to leave this to the discrimination of the gas engineer whose natural standard of suitability is that of the efficiency of which he has had previous experience, and who, however reasonable, will perhaps make somewhat grudging allowance from this standard for the substitute.

However, it is satisfactory to find that the Council are persuaded that managers may feel certain that the military authorities, acting in conjunction with the Ministry of Munitions, will not take badged or necessary men away from works engaged in efficient washing of gas unless and until satisfactory substitutes have been provided; and men should not be released until the substitutes have been proved efficient. In cases where any undertakings have no badges, they are urged to make a strong stand against tribunals where an endeavour is made to cancel exemptions. Appended to the report of the Council is an extract from the certified list of occupations which should assist managers to retain their outdoor men.

The "B.C.G.A." and Food and Fuel Economy.

IN the campaigns for food and fuel economy among the people, the gas industry should stand prominent; for food and gaseous fuel are interlinked in a manner which enables the proper use of the latter to produce an economy of the former. The gas-cooker, within the limits defined by the burners, the calorific value of the gas, and the power of resistance of the oven casing to heat losses, offers the largest controllable temperature range of any means of cooking—that is, the temperature of the oven can at will be regulated to any desired degree, subject to the limits named. This is at once an invaluable advantage to the careful user, and a disadvantage to the careless one. But because of the latter, the former cannot be denied the benefit. There is here educative work to be done in promoting fuel economy; and more especially is this true of the use of the top plate, where often in kitchens a fringe of flame is to be seen playing round utensils without useful heating effect, and where, too, boiling-rings are frequently kept alight when the work for which they were started has been finished. However, the cook, the kitchen maid, and the general servant are not, unless they altogether lack sensibility, impervious to appeals to assist in the national service by preventing waste of this kind. To the despots of the kitchen, household economy has not always made effective appeal; and to them it is a new idea, which we believe will strike home in double quick time, that the escaping flames round the kettle or the saucepan, and the gas jets left burning after having finished the duty required of them, are against the interests of national economy in the time of war, and that every saving that can be effected in this way is helping to ease the road to victory, and is therefore of service to our "Tommies" and "Jack Tars." The opportunity offers to make trial of the fresh inducement, through literature or cards for hanging in the kitchen. The lessons of the present in this regard will be of immense value in the competition of the future. Of this there can be no possible doubt.

The proper use of gas leads to food economy; and the Food Controller wants every possible form of aid that he can secure to bring the units of the nation to make it a personal matter to voluntarily and rationally economize in the consumption of food. Not only in consumption, but in the way food is prepared, economy can be achieved. Baking or roasting at too high a temperature wastes food; and operating at too high a temperature means fuel waste. There is here a reciprocal relationship of which gas undertakings can and should make use. We see from the report of the Executive Committee to the General Committee of the British Commercial Gas Association (from which we publish extracts in other columns to-day) that they have already moved in this matter of food and fuel economy. By the way, it may be incidentally acknowledged that it is found increasingly difficult—even for one long accustomed to keep close watch upon the trend of affairs directly or indirectly affecting the industry—to get in front with suggestions of the Executive Committee of the Association. They have already offered to Lord Devonport the hearty co-operation of the gas industry in his economizing work, as well as the organization and machinery of the industry in prosecuting it. No one better than gas undertakings could arrange for the distribution of suitable literature provided by the Government; and in the preparation of this the Association could co-operate with advantage, seeing the enormous extent to which gas-stoves, large to small, are used in the cooking of food. A grand opportunity would, indeed, be missed if the task and labour of the Food Controller were not utilized as a highway to work of a threefold beneficial character—beneficial for the nation, for gas consumers, and for the gas industry. It is hoped that the activity of the Executive Committee of the Association will be fruitful of much good in this direction.

It is noticed with interest that the course of the work of the Association during war time has been modified; and this is a politic proceeding, which must meet with the approbation of subscribers, and will induce them to help to create a good reserve by prompt payment of subscriptions, so that, at the termination of the war, there may be a gas publicity campaign worthy of the recommencement and expansion of business generally under peace conditions. It is no use doing a large amount of district newspaper advertising while fitting labour is scarce; but the intention of the Executive, to husband part of their resources till complete victory is realized, so as to supplement the then current ones, we hope will not result in any gas undertaking taking this (in the case of the Association) prudent line of action as an example to pursue within the limits of the ability of the undertaking to cope with work, because there should be no breach that can possibly be avoided in maintaining a continuous run of new business, though on a reduced scale. There is plenty of work the organization can do in laying, through proper channels, educative foundations which will have lasting effect. The work of the Association is directed not only to immediate result, but to future and progressive results. As is seen from the report, they have this work well in hand.

Statue of Sir Corbet Woodall.

To commemorate the work of Sir Corbet Woodall for the Gas Light and Coke Company, the Board have decided to erect a statue of him at the Beckton Gas-Works. The proposal has met with the hearty approbation of the proprietors. The choice of Beckton as the site for the statue is in two respects a happy one; in another, it is otherwise. In the Beckton works and its army of men, Sir Corbet took profound interest. The works were never to his mind, taken in their entirety, anything like what they should have been, judged by the standards of modern gas engineering; and he was heart and soul in everything that could be done by the Chief Engineer (Mr. Thomas Goulden) in modernizing them, and in raising their efficiency. His live interest in the works is one

reason on the side of suitability of site for his statue. Another is that the statue will ever remind the employees at Beckton of the man who did so much for them in (among other ways) the matter of the introduction into the Company of co-partnership. Following the lead of Sir George Livesey, this was a magnificent stride in the furthering of a great and beneficent cause. But, on the other hand, whoever wants to go to Beckton whose work does not call him there, unless it be to view the works for the first time, or the changes that have been effected? The proprietors of the Company require reminding, as well as the employees, of the work that Sir Corbet did for them; and an alternative place for a statue would have been the hall of the Company's chief offices in Horseferry Road. There a statue could have had fitting habitation, till such time, if ever, as the Company's offices are removed from their hidden place in the purlieus of Westminster proper, and brought into prominence befitting the position of the largest Gas Company in the world. But the Directors have given their preference to Beckton.

Annual Meeting of the Institution.

A departure is to be made from war-time precedent for the annual meeting of the Institution of Gas Engineers in June. It is to be extended to a two-day function. The business meeting will be held on the Tuesday; and the day following, at the invitation of the President (Mr. A. E. Broadberry, M.Inst.C.E.), a visit will be paid to the Tottenham Light, Heat, and Power Company's gas-works, in order to inspect the new section of plant for the production and purification of 4¾ million cubic feet of gas. With the rapid development of the district, and the necessity for a like development of the works, there have been during the engineership of the President some masterly reorganization and extension of plant on the site; and the new section is only one, though the latest, of several features of first-rate interest. There can be promise of a day worth participating in by fixing up this engagement for the day succeeding the meeting in London.

Fuel Conveyance without Labour.

The intense cold has aggravated the fuel problem, especially in London and the suburbs. The coal merchants have had no shortage in their stocks of household coal; but they have not the labour for its distribution. The gas companies, too, have had heavy pressure for coke; and, however much they would have liked to reserve supplies for the poor and to distribute them, they, too, are suffering from shortage of men. The miseries of the poor have, through absence of solid fuel, perforce had to be shared by people in better circumstances who, through living in flats, have only limited coal storage accommodation. Poor and other persons alike have had to go and purchase in quantities that they themselves could convey to their homes. Those owning motor cars or other private conveyances have been "in clover" (so to speak) in the matter of becoming their own solid fuel carriers. But at the best of times, it is a crude business the cartage (in small and comparatively small lots) of the agents for heating to the millions of homes in London and the suburbs and elsewhere—employing a host of men, horses, and carts, adding to the traffic and inconveniences of the streets, and increasing the labour in homes—when gaseous fuel can be conveyed by subterranean means without all this human and animal labour and vehicular adjuncts. The recent conditions—atmospheric and manual—accentuate the economy of fuel conveyance by underground pipes.

The Happier Lot of the Prepayment Gas Consumer.

The severity of the weather conditions would have been much intensified had it not been for the large adoption by the poor of prepayment gas meters and cookers. There is no other system of heat provision not requiring labour between the fuel "depôt" and the home that could have done for the people of all stations in life what gas has been doing the last few weeks. Large numbers of the poorest have been able to have—if they have not gas-fires—the comfort of illuminating burners, which have helped to keep their rooms warm; and they have had the comfort and convenience, though there may have been no fuel for the coal grate, of the handy gas-cooker for the provision of hot food and beverages. What would have been the conditions in London and the suburbs (taking the statistics at December, 1915) if there had not—to say nothing of the hundreds of thousands of ordinary connections—been 1,147,096 prepayment gas-meters in use, and 935,237 gas cookers attached to the systems? The figures show that no less than 81·5 p. ct. of the prepayment consumers have gas-cookers in use. They have been, during these hard times, highly fortunate above their fellows who have not such conveniences.

Calorific Standard and Inert Gases.

The application of the South Suburban Gas Company to the Board of Trade for a revision of their calorific power standard was the subject of much discussion before Mr. Garnham Roper last Tuesday. The Company five years ago were placed under a 540 B.Th.U. standard gross, with the penalty point fixed at 475 B.Th.U.—the extra 4½ p.ct. (making 12 p.ct.) margin being allowed in special circumstances, which are disclosed in our report in another part of this issue. The Company now asked that the standard, bare of margin, should be the 475 B.Th.U., above which, of course, it would always be necessary to work for safety's sake. About the suggestion there does not, in the circumstances, appear to be any particular extravagance; but the proposal brought the local authorities and railway companies flocking round, seeking to steal from the Company the advantage with which Parliament endowed them in 1912, and from which no one has experienced the slightest harm. The opponents required the penalty-line raised to 500 B.Th.U. Better for the Company to have stayed their hand in making application than for the penalty-line to be raised in the manner suggested. There must be protest against the pioneers in this matter being robbed of any slight benefit that they secured, and especially when it has not been proved to have been detrimental. As a matter of fact, throughout the evidence, there was not one of the opponents' witnesses who could say anything whatever that was really definite about the difference in the effect of gases varying in calorific value, nor as to whether it is not better for the consumer that a calorific power gas should be used which requires a lower proportion of air to effect complete combustion than a higher calorific value gas, seeing that the smaller the volume of air needed the lower the introduction through the medium of the air of incombustibles, which uselessly extract from the flame, and run off with, part of its temperature. There was talk of the ratio existing between candles and calories; there is no such ratio, except in the imagination of a few persons. The question of the percentage of incombustibles in gas was raised; but the London County Council, who have been making tests during the war (an instance is given towards the end of our report of the proceedings before Mr. Roper), should not take advantage of war conditions in respect of coal and the work that is being done for the Ministry of Munitions to raise this point. We called attention to this matter the other week in connection with the East Grinstead application [*ante*, p. 147]. The Board of Trade have evidently and properly concluded that this is not a matter that comes within their province, as no mention is made of it in the East Grinstead draft Order. If it is dealt with at all, it should be by a proper tribunal on competent testimony.

Coal Tar Analysis.

The paper on "Coal Tar Analysis," read by Mr. Frederick F. Mooney before the Manchester Junior Gas Association, and published last week, introduces some very interesting points. The author's contention cannot be denied, that some of the tar analysis results published in the Technical Press are practically valueless, owing to variations in carrying out the analyses. This is especially due to the difference in the amount of tar taken for distillation; and, of course, also to the method of testing. A strong point is made by him with regard to sampling. This is certainly very important; for unless a fair sample is obtained, the analysis is a real waste of time, and the results have no value. Sampling by means of a tube is not to be recommended, as there is always a certain amount of tar which escapes when the tube is withdrawn. This will give a higher percentage of water than actually exists, especially if the tar has been standing for some time. Mr. Mooney points out that the specific gravity test is valuable from a financial standpoint. This is so in ascertaining the number of gallons per ton. But why does he advocate taking the specific gravity of a dehydrated sample, and not a sample as sold? This surely necessitates calculation to obtain the number of gallons per ton as pumped into barge or tank-wagon. For distillation, the author

mentions a 5 cwt., and even a 1 ton sample. Of course, the larger the sample the more accurate the result; but the 2000 c.c. sample now usually taken in gas-works laboratories appears to give a fairly reliable analysis. Before the war, smaller samples than this were taken—frequently 500 c.c.; and then there was a great variation in the results obtained. The metal still for a 2000 c.c. sample is by far preferable to glass, owing to the danger of breakage and fire. The method of heating the still at the commencement of the distillation, as advised by Mr. Mooney, is good; and certainly tends to eliminate any frothing and "bumping." It is not understood how small globules of water and oil can be seen condensing on the thermometer bulb when a metal still is used; and this is a disadvantage against the metal still. Mr. Mooney states that after the water has been separated from the oils, they should be returned to the still. Surely this is hardly necessary when the benzene and light oils are subjected to fractionation, and the extra time expended by so doing is taken into account. There is nothing to be said regarding the method Mr. Mooney uses for the extraction of the tar acids, pyridine, and carbon bisulphide, except that, in the case of carbon bisulphide, sodium ethylate is quite as efficient as potassium ethylate. Mr. Mooney's paper is founded on good personal experience, and without doubt his method of testing tar is thorough.

Annual Meetings of Gas Proprietors.

There is a distinct movement in the gas industry in favour of annual meetings of proprietors in place of half-yearly ones. The railway companies and the banks have given lead in this direction; and now certain gas companies have obtained parliamentary authorization to meet annually, instead of half-yearly with power to the Directors to declare an interim dividend. Expense and labour are saved by the change; and it cannot be denied that the two halves of a gas company's year are so dissimilar that it requires a review of a whole year to get to the actual position and progress. Moreover, the proportion of proprietors who never trouble to attend the meetings is large in comparison with that of those who have the leisure and inclination to put in an appearance. In the Bill which the Gas Light and Coke Company have in Parliament, power is being sought to change from the half-yearly to the annual meeting; and when the Bill was introduced to the proprietors last Friday for their endorsement, there was not a dissenting voice raised to the proposal. The proprietors of the Brentford Gas Company had their first annual meeting on Friday; and it seemed quite natural for them to be listening to their Chairman (Mr. Reginald J. Neville Neville, M.P.) dealing with figures for the whole of 1916, instead of for a half year only. In the case of municipal gas concerns, the accounts are, as a rule, prepared and published annually; and there seems to be no good reason why for gas companies half-yearly reports and accounts should be issued and meetings held, except that investors are kept in closer periodical touch with the affairs of the business in which they have placed their capital.

Industrial Methods after the War.

In the report of their proceedings during the past year, the Employers' Parliamentary Council (who have for their objects "to take action with respect to any Bills, introduced into either House of Parliament, affecting the interests of trade, of free contract, and of labour, or with respect to the action of national or local authorities affecting in any way the said interests") devote a good deal of attention to the question of industrial methods after the war. The action of the labour unions in making the slow and unwilling man's pace the standard, is unsparingly condemned; and the Council say it is incredible that the system of limiting the production of the quick and willing man to that of the indifferent workman can be continued under the conditions that will assert themselves after the war. Labour must, it will be agreed, be free, and wages must be based on earnings, if all is to go well. That things are going to be different after the war from what they were before it, there is a general consensus of opinion, though the probable nature of the difference is undoubtedly the subject of great diversity of views. For instance, in spite of the formal resolutions they have passed, do the trade unions really believe that when peace returns to the world they are going back to all their old ways? Will men who have faced death in its most appalling forms once more allow themselves to be "persuaded" into joining a union they would prefer to keep clear of, and to other men will the short-sighted policy which so often used to fascinate ever again appeal? It seems unlikely. There will be a difference; but what will the difference be?

An Employers' View.

Europe generally, after the war, will not be rich enough to indulge in the systematic restriction of output with which unions, in this country, at any rate, had made people familiar. What is to take its place? The opinion of the Council is that no reasonable exception can be taken to the demand that after the war labour shall take a larger share of the profits of industry, provided that labour earnestly and wholeheartedly performs its part in the general scheme of production, and thus establishes a good title to the claim for greater remuneration. A high standard of production can be maintained only if the energies of capital and labour alike are exerted to their utmost capacity. Whatever the conditions, they say, under which various industries are conducted in the future—whether systems of co-partnership or profit-sharing, or wages—the effort everywhere will have to be of a generally sympathetic and high-spirited character if all concerned are to benefit in the shape of increased gains. Here is a policy worthy of whole-souled adoption by every labour leader and union throughout the country. Should the Council feel it their duty at any time to go more closely into the question of the best system of remuneration to select, they will be able to learn from one of their members—Mr. F. M'Leod, of the South Metropolitan Gas Company—everything there is to be said in favour of co-partnership.

Use Unscreened Gas Coal.

Of course, everything has to be sacrificed to the National interests in such times as these; and the gas industry has done a good part in making sacrifices. But there is another way in which it is suggested it can help. There is a shortage of men on the railways; and locomotives and much rolling stock have passed from here over to France. It is necessary on all grounds that the utmost use should be made of the rolling stock that remains; and expedition in despatch and unloading is one way of doing this. This, however, does not always mean economy for the consignees, Now the Ministry of Munitions suggest, in a letter attached to the report of the National Gas Council published in other columns, that expedition in the despatch of rolling stock from collieries may be served by gas undertakings with coal-breakers agreeing to accept unscreened coal in place of screened. It must be done if need be, though there is a strong preference for carbonizing with clean coal. It is stated that "any objections to the adoption of this proposal would appear to be of little weight when compared with the importance, not to say absolute necessity, of the maximum use being made of all available transport facilities." But nothing is said as to the concession that the colliery owners will be prepared to make on being relieved of the work of screening and picking, if provided by the contracts.

Sulphate of Ammonia Facts and Figures.

Under the title of "The Profits of the Earth," the Sulphate of Ammonia Association, of No. 84, Horseferry Road, S.W., have marshalled a great number of convincing facts and figures with regard to the benefits derived from the use of the particular nitrogenous fertilizer in which they are interested; and these are issued in the form of a booklet, the general get-up of which is so excellent as to compel attention. There is a brief explanation, put into simple language, of the change which makes sulphate of ammonia after application to the soil available to the plant as food; and then the reader is shown wherein sulphate of ammonia is superior—and its advantages are seen to be many—to other forms of nitrogen. But the letterpress is not all; there are in addition many photographs of land and crops—and cultivators. Details are given of, and some of the illustrations refer to, last year's Patriotic Root Crop Competition, the names of the prize-winners in which were published in the "JOURNAL" for Nov. 21 [p. 404]. There is also an announcement as to the classes and prizes for this year's competition. As to wheat, there is the report by Prof. Douglas A. Gilchrist, M.Sc., of Armstrong College, Newcastle-on-Tyne, with regard to trials of autumn application of sulphate of ammonia for the 1916 crop in the counties of Durham and Northumberland. Including beside what has been mentioned, directions for use and other practical information, the booklet should greatly assist the propaganda work of the Association among home farmers, who will, it is to be hoped, while studying the portraits printed on one page of women cultivators (whose patriotism is greatly deserving of recognition), take careful note of the fact emphasized on the opposite page—that "Sulphate of ammonia is the only British form of nitrogen that is produced, and it is the best."

PERSONAL.

At last Wednesday's meeting, the Halifax Town Council adopted a recommendation of the Gas Committee to increase by £100 a year, from £700 to £800 per annum, the salary of Mr. W. B. M'LUSKY, the Gas Engineer and Manager.

Mr. C. F. FITCH, whose name appeared among the New Year's honours (Indian list) as a C.I.E., is the son of the late Mr. W. T. Fitch, who was formerly Manager of the Plymouth and Stonehouse Gas Company. Mr. Fitch is in business at Mussoorie.

Mr. E. H. W. COOKE, Auditor of the Birmingham Corporation Gas Department, has, at the request of Mr. Neville Chamberlain, Director-General of National Service, been released for employment in London in connection with the preparation of the register of volunteers for national service.

Mr. F. JOURNET, the Senior Country Traveller of Messrs. John Russell & Co., Ltd., representing the London House, was presented on the 10th inst. with an illuminated testimonial by the staff, to commemorate his fifty years' service with his firm. The presentation was made by Mr. C. Liddell Simpson, the London Manager and Director.

OBITUARY.

The death has taken place at his residence of Mr. ARCHIBALD MACKAY, Gas Coal Merchant, of Edinburgh. Struck down with influenza, which developed into double pneumonia, he passed away on the 6th inst., after only a few days' illness, being survived by a widow but no family. Born in Lancashire in the ironworking district some sixty years ago, his early years were spent with the Monkland Iron Company, where he became well known in the West of Scotland. He afterwards was a representative of the Niddrie and Benhar Coal Company for their gas coals. More than thirty years ago, he set up in business for himself as a gas coal merchant, and was well known to most gas managers in Scotland. Of a cheerful and benevolent disposition, with a great gift of humour, he had a wide circle of friends, by whom his loss will be greatly mourned.

THE GAS INDUSTRY AND THE WAR LOAN.

BUT very few days now remain ere the lists will be closed for subscriptions to the great War Loan, the dimensions ultimately reached by which will inevitably be regarded as some criterion of the determination of the people of this country to continue to a triumphant conclusion the terrible struggle into which their enemies have forced them. We hope, and believe, that when the complete figures are published the loan will prove to have been a success that will alike astonish both friend and foe. Ever since subscriptions were first invited, the papers have been publishing lists of princely contributions; but these, of course, represent only a very small proportion of the total number of applicants. What would be the feelings of those who are mourning the loss of loved ones, sacrificed at the altar of duty, if they found there were some people who even refused to lend their money?

Not a whit less loyal than others, we feel confident that the gas industry has, as it was urged to by Mr. H. E. Jones, in a letter which appeared in our "Correspondence" columns some weeks ago, done all it can to swell the nation's funds. Individual cases have been noted in the "JOURNAL" pages; but it is clearly recognized that, without the aid of our readers, the preparation of anything like a full list would be utterly impracticable. A list as complete as possible would, however, it is felt, be of great interest to place on record; and the aid in its preparation of those who have subscribed is sought. Will gas companies, gas authorities, and manufacturing firms therefore kindly send along a note of their contributions and their schemes for publication?

In last week's issue the Birmingham Gas Department scheme was referred to, and the subscription of the Belfast Gas Committee; and now Mr. J. Ferguson Bell writes that three of the Midland gas undertakings with which he is connected have decided to subscribe the following sums: Derby Gas Light and Coke Company, £60,000; Burton-on-Trent Gas and Electricity Committee, £25,000; Chesterfield Gas and Water Board, £20,000. Then on another page to-day there is reproduced the plan formulated by Messrs. Glover and Main, Limited, to enable their staff and employees to become holders of war loan stock.

A large contribution is that made by Colonel Brotherton, of Leeds (the Chairman of Messrs. Brotherton and Co., Limited, chemical manufacturers), who has invested £500,000. He was Lord Mayor of Leeds when war broke out; and his subscription to the loan may be regarded as the fulfilment of a promise he made to the City Council to give to the Government in the prosecution of the war all the financial support in his power.

Distillation Process in the Vertical Retort.—Pressure of other matter on our space to-day has necessitated the holding over of the further instalment of the translated report on the investigations by Heeren J. N. E. Teune and P. J. Kummel at the Amsterdam Gas-Works, the first portion of which appeared last week.

ELECTRICITY SUPPLY MEMORANDA.

NEXT to the actual war, the breaking-off of diplomatic relations between the United States and Germany, and the German submarine outrages, ranks the question of our voluntary efforts in regard to food economy, in response to the appeal of Lord Devonport. With some epicures and gluttonish persons the subject of food is of first importance. But we are not all epicures, nor are we all gormands; and those who are not can soberly consider the Food Controller's appeal, and honestly try to give effect to it. Each individual under the voluntary rationing scheme is allowed 2½ lbs. of uncooked meat a week. There is an opportunity here for the gas industry. There are in the United Kingdom millions of gas-cookers in use, and these have a range of controllable temperature unmatched by any other form of cooker. The electric-oven has fixed temperature control—say, quarter-on, half-on, three-quarters-on, whole-on, and nothing between, except when there is overlapping of the heat on making a change in the regulation, and this varies according to the efficiency of the insulation. Opportunity should, therefore, be taken of the food-economy campaign to impress upon gas consumers that economy in gas and a saving in the weight of cooked meat can be obtained by first using an oven with a high temperature to seal the outside of the joint, and then continuing the baking or roasting at a lower temperature by reducing the gas jets. The weight of the cooked meat is entirely a matter of temperature and time, and composition of the joint—no matter the source of the heat, though electrical perverters of the truth suggest that there is some occult influence at work in connection with electric-ovens that causes meat cooked in them to lose less weight than when cooked at equal temperatures derived from some other heat source. This brainless attempt to gain an advantage has yet to be explained; the only explanation so far forthcoming being that the electric-cooker suffers so many disadvantages—from initial cost, dear B.Th.U., and a mass of difficulty, including unreliability, to slow and expensive hot-plate operation—that deviation from the path of truth is necessary to justify the existence of the electric-oven. This is the Prussian plan in defending their submarine, aerial, and other atrocities. However, facts fail to support the electrical allegation as to the waste of meat through the almost universally used gas-cooker. It is learned that the amount of meat that reached the London market during January (including poultry, &c.), was 31,653 tons, which gives an average per week per head of 2⅜ lbs. for a population of 6 millions. Of course, meat reaches London that does not go through the markets; but, on the other hand, there are butchers outside London who buy from the Central Market, and this about provides a counterbalance. But, on the basis named, the consumption of meat in January was only 2 ozs. per head per week more than the Food Controller has prescribed; so that per head, assuming an average consumption, there is not much sacrifice to be made to comply with his request. The point of this is that, though the gas-cooker is so freely used, the people of London, taking the average consumption of meat, were not, before the Food Controller's appeal, consuming far in excess of the 2½ lbs. suggested as a fair apportionment. This speaks well for gas cooking.

Food Economy.

At or Below Freezing-Point.

The writer was seated in a railway carriage, making himself as comfortable as possible under the severe wintry conditions existing outside. Two men opposite—strangers to the writer—had been talking, sufficiently loudly to annoy their reading fellow passengers, on the perennial subject of the war, when one of them changed the subject by asking his neighbour whether he had had any of his water-pipes frozen at home. The reply arrested the attention of the writer: "Only an outlet-pipe from a lavatory cistern. But you see," he added, "we have gas lighting all over the place; and I keep three or four burners going all night in the upper part of the house when it is freezing." He wound up by asking how his friend had fared. His reply was also interesting: "We have not had any. I have electric light in parts of the house; but an experience I had in the house we occupied when first married induced me in our present house to have gas-burners put in the tank-room, bath-room, and lavatories, and wherever there are water arrangements; and these burners, like yours, are kept going all night when there is frost." That in effect was the reply. His friend asked what was the nature of the early experience. The answer was: "Well, one winter's night we had a pipe burst leading from the tank in the upper part of the house; and by next morning our drawing-room was practically ruined. We had the pipe repaired, but took no precautions to prevent a recurrence of the mishap. Next winter precisely the same thing happened again. Then I asked the plumber who repaired the fractured pipe what could be done to prevent this sort of thing; and he suggested keeping the temperature of the atmosphere round about the tank and the connections above freezing-point by using a gas-jet. I took his advice. It was effective. When moving into my present house (where we use gas for cooking and for heating in some of the rooms), I had gas put in for lighting wherever there are water cisterns or pipes." This was an unsolicited testimony from perfect strangers as to the efficiency of gas in maintaining comfort and convenience.

In the writer's own gas-lighted house, there has been no trouble with the water arrangements; in a neighbour's electrically lighted house, the water supply in the upper part is, at the time of writing, completely stopped. The plumbers who are not away on military service are about to have a busy time; and much of the inconvenience and expense to electricity-using householders would have been averted by the assistance of a few gas-burners.

A Large Electric Cooking Installation.

The condensation rule which the "Electrical Times" usually rigidly enforces in dealing with news or descriptive matters has been broken in giving an account of a new electric cooking installation at Carrick's Restaurant, Newcastle-upon-Tyne. Nearly six-and-a-half columns of the valuable space of our contemporary have been devoted to this particular piece of work. Such lavishness has a cause; and the cause is that the installation has a capacity of 250 KW., and is believed to be the largest single electric cooking plant in any hotel or restaurant in the country. The article concludes with best wishes to Messrs. Carrick for a return commensurate with their enterprise. Nothing less could be desired by an electrician supporting a heating agent which has birth at a great loss of heat energy. And Messrs. Carrick, at any time they may be in tribulation owing to the plant misbehaving itself in any way, may well console themselves with the reflection that, at its introduction, our contemporary "had not the least doubt the behaviour of the electrical equipment would justify their confidence in electrical operation." The faith that is here expressed in the reliability of the plant suggests that the "Electrical Times" has not been brought into intimate contact with electric cooking apparatus, and so does not know of its many vagaries; otherwise the writer was attempting to impose on the credulous. There is also hearty congratulation to the Newcastle-upon-Tyne Electric Supply Company upon the acquisition to its mains of what should be a connection with a good load factor. Now is this all as it seems, or is there a fair amount of speculation (for advertisement purposes) about the installation, as there has been about certain other installations over which there has been some loud trumpeting? It would be interesting to have answers to a few inquiries. Has the Newcastle Electric Supply Company a subsidiary Company who hire-out apparatus? Was this plant put in by the subsidiary Company? Have Messrs. Carrick paid anything for the new plant? Are they paying a hiring rate for it? Is the basis of contract with the Company supplying the electricity that the cost is not to exceed what it did before (say, for a given number of meals), when gas was used? And that, if any more than a certain number of meals are served, is there to be a proportionate increase in the charge for current? Is it not a fact that the gas-cooking apparatus is being retained, apparently as a stand-by? We may leave the matter there.

A New Electric Lighting Bill.

Some time in the remote past—years before a war was thought of—the Incorporated Municipal Electrical Association promoted a Bill to confer upon municipal electricity undertakings increased powers in speculative trading. The Bill from the first was menaced as it merited with strong opposition; and Parliament has never yet been persuaded, whatever the opinion of the promoters, that there was any need for a hurried consideration of the measure. It has not, therefore, been considered, though some effort has been made to keep it in view by giving it a periodical formal introduction to the House of Commons. Thereafter it has again retired into the background, where it lurks in the hope of some day achieving greater success. Now there is talk of another Bill being in course of preparation. In the annual report of the British Electrical and Allied Manufacturers' Association, it is announced that the organization is co-operating with the Association of Power Companies in drafting a new Electric Lighting Bill. This is interesting; and the interest will be intensified when the draft of the measure is available for inspection.

One Hundred Years After.

"Meteor," of the "Electrical Times," makes merry over the advertisement by one "Candidus" that appeared in "The Observer" on Jan. 26, 1817, and was reproduced by us one hundred years later [*ante*, p. 223], as an interesting piece of testimony of how some timid souls in those early days regarded gas supply which afterwards became, and continues to be, so popular. There are people existing in 1917 who have no scientific knowledge of the subject, and are fearful windbags when they speak about or write upon it. If the "impartial inquiry" of "Candidus" concerning "the injurious effects on the health of the community from the use of coal gas for lighting," had results which were opposed to the employment of that agent, then the years that have passed—years in which gas lighting has been constantly used, and in many of which cooking by gas has been universal, and, notwithstanding, in all of which the populations of the countries of the world have both increased and prospered—have proved the groundlessness of such results, and scientific research has supplemented the living facts. But "Meteor" of the "Electrical Times" rejoices; he always does so, upon the least provocation, where he thinks that gas is at all adversely concerned. For him sufficient is a century-old piece of unscientific work—"unscientific," for whether the results were for or against, it is quite certain that "Candidus" had not then the scientific means which exist to-day for making any "impartial inquiry" concerning the injurious effects of gas lighting on health. "Meteor" thinks the "fears" of "Candidus" little more than "intelligent anticipations." "He did not foresee the huge death roll that gas was to inflict upon Great Britain." Nor did he foresee the appalling roll of death that electricity has compiled in the course of a comparatively few years. Again "the explosive force of gas, its poisonous effects, and its fire risks are the common fear of everybody concerned." This common fear, we suppose, accounts for the 209 p.ct. increase in the gas sales of statutory concerns since electricity entered the field as a competitor. "Meteor" does not like the job of tackling this 209 p.ct., which shows that "Candidus," "Meteor," and electricity combined have not succeeded in stemming the tide of a great popularity. Our journalistic friend prefers petty gibes at gas, the while keeping a respectful distance from all discussion regarding it on a scientific basis. The sacrifice of life and the fires due to electricity have little outward concern for him. His next paragraph deals with the "Self Accentuation of Decay."

Differential Prices and Temptations.

All electricity consumers are not rogues and thieves; some are. The necessity for charging a very low rate per unit for power and heating, and a high one for that employed for lighting, is a disadvantage, and a temptation to consumers. Hugh Leslie Smith, of Rugby, has proved this. He had an installation of electricity made at his house in November, 1913; but in October last an official visited the place, and found that there was wiring for lighting purposes in practically every room, that lamps of 60 to 80 c.p. were in use, and in an attic occupied as a workshop one of 300 c.p. Now the charges for heating and power at Rugby are respectively 1½d. and 2d. per unit, against 4½d. per unit for lighting. The 1½d. and the 2d. proved too great a temptation for Hugh Leslie Smith; and he thought it would be a good thing to have current for lighting at the power price. That was the first step in his progress to the Police Court. His defence was that the lamps were used for warming during the day-time. This was a sufficiently frank confession of roguery; but another witness was a bared space on the consumer's cable behind a picture in the hall of the house, which space had been prepared for making ready connections. To give a complete finish to his own conviction at the Police Court, Smith had made arragements so that there was no obligation on the part of a portion of the 1½d. and 2d. current consumed to pass through the meter. The evidence of guilt brooked no negation; and Smith is poorer to-day by £10 and costs. He should consider himself fortunate that he got off so lightly.

Demonstrating Capacity.

In the opening paragraphs of the "Memoranda" last week, it was no doubt observed that, by one electrical paper, we had been accused of being jealous of the progress of the electric power load. On the other hand, it has been found that "Electrical Industries" is not satisfied with what has been done in attempting to further popularize electric motors among manufacturers. It is considered by our contemporary that the problem to be solved is how to get the opportunity of demonstrating the value of electric power as an industrial driving force, and so dissipating the obstructing ignorance. Apparently the efforts so far have been failures; for it is said: "Many efforts have been made to interest manufacturers and other power users in electricity. Exhibitions have been held, electrical engineers have spent lavishly on large installations at great international exhibitions, and advertising has been tried to a considerable, though not extravagant, extent." But upon all this it is confessed that "the progress made has been slow." The increased use of electric power under the urgent stimulus of war demands has proved, the writer says, how wide a field is left untouched. Therefore, it is suggested that a bolder policy seems to be required; and for this bolder policy our contemporary looks to America, and finds it in the "Electrical Review and Western Electrician." This source of information states that numerous companies in America have resorted to the plan of instituting trial installations of electric power in works, the proprietors of which have been induced to entertain the proposals. Several managers of American electricity concerns bear witness that these trial installations really pay. For instance, the Dayton Power and Light Company state that the policy has brought over 1000-horse power of business which could not have been secured by any other means. It is not likely that trial demonstrations at the works are with anything but comparatively small power motors, unless the manufacturer enters into a prior agreement to take the motor if the results come up to those guaranteed. There is a hint here which may be worth consideration, though in the gas industry the means of proving capability in the gas undertakings' or manufacturers' own demonstration rooms are found to have profitable result. At the same time, it is necessary to keep in view, and pace with, the methods of the competitor.

A report recently published by the United States Geological Survey states that the American fire-brick industry has shown remarkable growth; the value having increased more than three-fold in the last 21 years, attaining its maximum in 1913. The value of the output of 1915, however, was only about £357,438, as against £518,520 in 1913.

GAS COMPANIES' POWERS IN QUEENSLAND.

IN our issue for May 9 last year [pp. 266 to 269], the text of a Bill to regulate the whole of the gas companies in Queensland was printed, together with comments which we made on the various clauses. We have now before us the Act, which received the Royal Assent on Dec. 13; and it shows that many of the objections we raised have been met by alterations of the provisions to which we drew attention. It may not be without interest if we briefly indicate the principal changes which have been made.

The Act now applies only to persons supplying coal gas—not, as before, to any person supplying any gas. The dual prescription of candle power and calorific power has been dropped. No prescription of candle power or penalties is now made; while the heating value is to be 500 B.Th.U. total heat, instead of 540 B.Th.U. The prescription of a calorimeter, which was absent in the Bill, is now filled by the direction that the standard instrument is to be the Simmance-Abady calorimeter. There is a standard of purity (no SH_2 and not more than 4 grains of NH_3 per 100 c.ft.) and of pressure—*i.e.*, 15 10ths.

A proviso is added to the appointment of Gas Referees (who have extensive judicial authority), to the effect that no person shall be so appointed who is in any way directly interested in any gas, electric, or other light or power supply company. Right of appeal from any Referees' decision is given.

The obligation to supply has now been modified in a company's favour; the distance from the premises to the main being reduced from 50 to 25 yards, while provisions giving security for the continuity and proper use of supply—on the absence of which we commented strongly—have been added. Similar safeguards to a company are added to the provision for a supply in a defined locality on the request of twenty occupiers and owners; and, in addition, a minimum return from such supply is now prescribed. This meets another of our comments, and brings the provisions more in accordance with home practice.

The charge for prepayment meters is fixed at 10d. per 1000 c.ft., irrespective of the price of gas; but a minimum sum of 2s. per month per meter, for gas and meter hire, can now be demanded from the consumer. Power is given to the directors of a company to appropriate out of revenue an annual sum as "reserve fund." Meters and fittings are not to be subject to distress for rent.

There are many other amendments of the draft which do not call for special notice; and with the exception of the major provisions to which we have drawn attention, the general scheme is as set out in the draft Bill. It will be interesting, as time goes on, to see how the novel scheme of gas undertaking regulation works in practice; and we can only hope that the result will be satisfactory alike to the undertakers, the consumers, and the State.

COMMERCIAL GAS COMPANY.

Half-Yearly Report.

THE following is the report for the six months ended Dec. 31 which the Directors will present at the meeting on Thursday.

The Directors submit the accounts for the half year ended Dec. 31, 1916. The revenue account shows a net profit for the half year of £47,485, which, added to the balance of £87,874 brought forward from the previous half year, produces a net revenue balance of £135,359. Deducting therefrom £9097 for interest, there remains standing to the credit of the net revenue account a balance of £126,261 available for dividend.

The Directors recommend the payment of the statutory dividends thereout at the rates of £4 18s. 8d. p.ct. per annum upon the 4 p.ct. stock of the Company, and of £4 13s. 4d. p.ct. per annum upon the 3½ p.ct. stock, both less income-tax. The balance of the net revenue will be carried forward to the next half year.

Messrs. W. G. Bradshaw, R. Y. Bevan, and Sir T. F. Victor Buxton, Bart., three of the Directors, retire by rotation, and, being eligible, offer themselves for re-election.

WILLIAM GRAHAM BRADSHAW, Chairman.

Gas-Works, Stepney, Feb. 1, 1917.

The Accounts.

The accounts accompanying the report consist of the usual set of statements. They show that the paid-up stock on Dec. 31 amounted to £996,405; that £1,076,875 had been added by conversion, making £2,073,280; and that £149,298 remained unissued out of the total authorized capital (including premiums) of £2,235,000. The total amount borrowed at this date was £339,062 10s., and £135,937 10s. was added by conversion; making a total of £475,000, and leaving £79,226 to be borrowed out of the £550,000 authorized. Capital account receipts amount, with premiums, to £2,606,065. The expenditure stands at £1,481,949, with a nominal amount of £1,212,812 added by conversion—together, £2,694,761. There is thus a balance of £88,696 carried to the balance-sheet. A sum of £16,000 was expended during the half year on a new steamship, £389 on new and additional mains and services, and £3061 on new and additional stoves; but £2138 is credited for prepayment meters and fittings. The reserve fund amounted at the close of the half year to £42,569, and the insurance fund to £32,993.

The following is the revenue account:

Expenditure.

Manufacture of gas—		
Coal and oil, including dues, carriage, unloading, and trimming	£172,607 3 3	
Salaries of Engineer and officers at works	3,181 13 6	
Wages (carbonizing)	12,734 4 0	
Purification, including labour	1,297 18 7	
Repair and maintenance of works and plant, materials and labour (less £258 1°s. 11d. received for old materials)	34,355 18 7	
		£224,176 17 11
Profit sharing		2,381 11 7
Distribution of gas—		
Salaries and wages of officers (including rental clerks)	£6,517 15 2	
Repair, maintenance, and renewal of mains and services, material and labour	5,080 14 0	
Repair and renewal of meters	3,317 17 8	
" " " " stoves	11,806 2 9	
" " " " prepayment meters and fittings	10,729 3 1	
Maintenance of mantles and fittings	1,394 8 0	
		38,846 0 8
Public lamps—lighting and repairing		3,003 11 6
Rent, rates, and taxes		12,689 15 4
Management—		
Directors' allowance	£1,250 0 0	
Company's Auditors	75 0 0	
Salaries of Secretary, Accountant, and clerks	1,066 17 10	
Collectors' salaries and commission	1,507 13 8	
Prepayment meter collection	4,534 15 9	
Stationery and printing	1,726 14 5	
General charges	3,011 0 1	
		13,172 1 9
Bad debts		302 8 7
Law and parliamentary charges		50 12 6
Superannuations and allowances and Workmen's Benefit Society, &c.		2,559 19 3
Official officers, &c.		141 10 7
National Health and Unemployment Insurance		539 4 11
Allowances to employees on active service		2,929 4 0
Total expenditure		£300,792 18 7
Balance carried to net revenue account		47,484 17 0
		£348,277 15 7

Receipts.

Sale of gas—		
Per meter (number in use, 116,924) at 2s. 8d. per 1000 cubic feet	£228,894 7 5	
Public lighting and under contracts	4,845 0 11	
	£233,739 8 4	
Less discounts and allowances	10,665 0 9	
		£223,074 7 7
Rental—		
Meters (24,564)	£3,017 2 7	
Stoves (88,186)	14,075 4 10	
Prepayment meters and fittings (9°,689)	18,443 3 9	
Maintenance of mantles and fittings	726 7 5	
		36,261 18 7
Residual products—		
Coke, less £4565 12s. 4d. for labour	£60,046 9 11	
Breeze, less £1179 8s. 3d. for labour	1,611 0 7	
Tar	9,546 18 4	
Ammoniacal liquor and sulphate of ammonia	16,814 8 1	
		88,918 16 11
Miscellaneous receipts—		
Rent receivable	0 10 0	
Transfer fees	22 2 6	
		22 12 6
Total receipts		£348,277 15 7

The following statements relate to the working:

Statement of Coal and Oil.

—	In Store June 30, 1916.	Received During Half Year.	Carbonized During Half Year.	Used and Sold During Half Year.	In Store Dec. 31, 1916.
	Tons.	Tons.	Tons.	Tons.	Tons.
Coal	19,493	103,513	100,953	604	21,448
Oil—gallons	361,208	1,079,829	906,706	..	534,331

Statement of Residual Products.

Description.	In Store June 30, 1916.	Made During Half Year.	Used During Half Year.	Sold During Half Year.	In Store Dec. 31, 1916.
Coke—tons	1,637	65,619	9,016	51,850	6,390
Breeze—tons	4,143	7,923	..	7,855	4,211
Tar—gallons	452,318	1,171,842	..	951,812	672,348
Ammoniacal liquor—butts of 108 gallons	8,429	34,731	28,478	..	14,682
Sulphate of ammonia—tons	39	932	..	801	170

Statement of Gas Made, Sold, &c.

Quantity Made.	Quantity Sold.		Quantity Accounted for.	Number of Public Lights.
	Public Lights and under Contracts (estimated).	Private Lights, per Meter.		
Thousands.	Thousands.	Thousands.	Thousands.	
1,963,878	26,006	1,720,708	1,776,172	3807

The last statement is the balance-sheet, which gives the value of the stores in hand at the close of the half year as follows: Coal, oil, &c., £48,080; coke and breeze, £7465; tar, ammoniacal liquor, sulphate of ammonia, &c., £14,946; sundry stores, £47,096—total, £117,589. The figures this time last year were: Coal, oil, &c., £36,311; coke and breeze, £5947; tar, ammoniacal liquor, sulphate of ammonia, &c., £10,873; sundry stores, £41,031—total, £94,161.

NATIONAL GAS COUNCIL OF GREAT BRITAIN AND IRELAND.

Executive Committee's First Report.

ON Monday last week, the Executive Committee of the National Gas Council presented their report to the General Consultative Committee. Among the various matters dealt with were the following:

COMMUNICATION WITH GOVERNMENT DEPARTMENTS.

Communications have been sent to the heads of Government Departments in all cases where it was thought they might require to get into touch with the industry—suggesting that they should do so, whenever necessary, through the medium of the Council.

Among the acknowledgments received, one from the Director-General of National Service stated that, as his plans developed, he hoped to be in a position to avail himself to a large extent of the advice and assistance of bodies representing the commercial life of the country in its various phases, and that he would be glad to bear in mind the offer the Council had made.

FURTHER RECRUITING FROM THE INDUSTRY.

The Special Committee—consisting of the Executive and several co-opted members—on the Reservation of Essential Men from Military Service, having taken over the work of the deputation which attended at the Board of Trade (Reserved Occupations) Committee in October last, issued, on the 27th of November, a circular inviting particulars as to possible further recruiting from the gas industry, which was sent to every gas undertaking with a make of ten million cubic feet of gas per annum and over, together with: (1) A letter calling attention to the formation of the Council. (2) Copies of the constitution and rules and the list of officers and members of the Council. (3) A statement regarding proposed further recruiting. (4) Extracts from the list of certified occupations. (5) A statement as to the certification of orders.

Gas undertakings in Ireland were also communicated with in the same way, except that the circulars regarding recruiting were omitted.

The information received from such of the gas undertakings as replied has been dealt with in consultation with the Ministry of Munitions, and in many cases assistance or advice that has proved of value has been given by the Council.

THE DE-BADGING ORDER.

The Special Committee subsequently took into consideration as promptly as possible a circular [MM. 100] issued by the Ministry of Munitions as to the de-badging of unskilled and semi-skilled men; and after the Chairman of the Executive and the Joint Honorary Secretaries, assisted by Mr. T. Goulden, had consulted with representatives of the Ministry, a notice was published in the Technical Press to the effect that these unskilled and semi-skilled men would not necessarily be called up without the provision of suitable substitutes.

> NOTE.—Managers may feel certain that the Military Authorities acting in conjunction with the Ministry of Munitions will not take any necessary man away from works engaged in efficient washing unless and until a satisfactory substitute has been provided; and the Council have impressed upon the authorities the need for particular types of men for particular classes of work. The importance of enabling the gas industry to carry on its essential work is undoubtedly fully realized by the authorities.

The Ministry intimated that they had no intention of depriving undertakings of the minimum of labour essential to the carrying on of their work, but the undertakings must co-operate readily with the authorities in the work of substitution. In the event of difficulties arising, gas managers were advised to communicate direct with the Secretary of the Ministry of Munitions.

A classification of skilled, semi-skilled, and unskilled men in the industry has been temporarily agreed between representatives of the Ministry of Munitions and the Council; and it is understood that the Ministry are going to issue further instructions to individual undertakings with whom it is proposed to deal on a uniform basis by a special staff of the Ministry.

The Committee have been urged by the Ministry of Munitions to emphasize the importance of every undertaking instituting oil-washing wherever possible.

The Ministry of Munitions have also inspected factories engaged in the work of manufacturing and repairing meters, stoves, and other gas appliances; and it is hoped that a suitable scheme of substitution of labour will be decided upon regarding those industries which, it has been pointed out to the Ministry, are absolutely essential if the consumption of gas is to be maintained, upon which the quantity manufactured directly depends.

CALORIFIC POWER STANDARD ORDERS.

The industry was notified through the Technical Press that the Committee had ascertained that the Board of Trade proposed to grant Orders for the substitution of the calorific power standard in lieu of the illuminating power standard on the lines of the Sheffield Order without holding inquiries except in very special circumstances.

Subsequently, a deputation consisting of the Hon. Secretaries and Mr. T. Goulden attended, at very short notice, a conference at the Board of Trade relative to an application by the Railway Companies that a penal minimum pressure of 20-10ths should be inserted in Orders under the Gas (Standard of Calorific Power) Act, 1916. The Railway Companies were represented by a large number of officers; and their case was conducted by Mr. Talbot, K.C. The Committee are glad to be able to report that the Board decided, "as a general rule and in the absence of exceptional circumstances," to provide in the Orders made by them under the Act that the gas shall be supplied by the undertakers at a minimum pressure of 15-10ths of an inch, and to insert in the Orders a clause in the following form:

> "If, after the expiration of five years from the date of this Order, application is made to the Board of Trade by the company or by any body or person who may appear to the Board of Trade to have a substantial interest in the matter to reduce or increase the standard calorific power or the pressure prescribed by this Order, the Board of Trade, after hearing the parties and any other persons who appear to the Board to be interested, may make such reduction or increase of the standard calorific power or of the prescribed pressure as they think fit."

RESEARCH AND EDUCATION.

Communications have been received from Sir Joseph Bellamy: (1) As to the promotion of a scheme for organizing original research in chemistry and science on behalf of the industry. (2) On the question of education after the war; and suggesting the formation of a Government Employment Bureau for the purpose of supplying candidates from the technical schools to the various industries throughout the Empire in which science (and especially chemistry) or technology are essential, so that the lack of co-operation which now exists may be overcome. The latter is receiving the careful attention of the Committee with the object of taking the matter up with the Board of Education.

The report was fully discussed, and, no amendment having been made, was duly approved.

TRIBUNALS AND MEN IN OUTDOOR DEPARTMENTS.

The Executive Committee of the National Gas Council forward the subjoined statements for publication:

The Council desire to bring the following facts to the notice of managers of gas undertakings, which should prove of assistance when appearing before tribunals in connection with appeals for the retention of men engaged in any outdoor department—viz., inspectors, main-layers, service-layers, fitters, &c.

List of Certified Occupations, R. 117 Feb. 1, 1917 (p. 6)	Mechanics and similar men engaged in the maintenance or repair of an employer's plant, machinery, or tools.
	* Age at which reservation begins For single men 30. For married men 27.

*"The age to be taken is the man's age at the 4th of April, 1916. A man who had not reached the age stated at that date will nevertheless be entitled to be treated as in a certified occupation if, before his case has been decided by the tribunal, he has been found, on examination by a Recruiting Medical Board, not to be fit for general service or for garrison duty abroad."

Changes in List of Certified Occupations R. 118 (P. 1) states:

"Men under the age limits stated in the list who are classed in Category B (1)—*i.e.*, for garrison duty abroad—are no longer entitled to be treated as in a certified occupation, as they were under previous lists."

With regard to men engaged in the indoor department of gas undertakings, the following should be noted:

List R. 117, p. 20, states:
"Gas-works: All classes of workmen inside the works,"
and on p. 21
"Clerks in industrial establishments."

In most industries there are certain clerks who are indispensable on account of their technical knowledge, their intimate acquaintance with their employer's business, or the managerial and directing character of their work. It is impossible to separate these men by classification from other clerks who can be replaced, as the distinction depends upon the circumstances of the individual case rather than upon the description of the occupation. Needful exemptions must, therefore, be left to the tribunals, after consideration of each case on its merits, including the national importance of the business concerned.

SCREENED AND UNSCREENED COAL.

The Council also desire to draw the attention of gas managers to the letter from the Ministry of Munitions, as set out below. It is felt that every possible assistance will be rendered, in order to help

the Government to organize the country's resources at the present time.

Ministry of Munitions of War,
Explosives Department,
Storey's Gate, S.W.,
Feb. 5, 1917.

Sir,—Considerable difficulty is being experienced generally in obtaining supplies of rolling-stock to meet the continually increasing requirements; and a suggestion has been made that if gas-works with mechanical coal-breakers were to arrange to accept unscreened in place of screened coal, a quicker dispatch could be given to the wagons from the collieries. Any objections to the adoption of this proposal would appear to be of little weight when compared with the importance, not to say absolute necessity, of the maximum use being made of all available transport facilities; and accordingly I am directed by the Minister of Munitions to ask your Council to give this proposal its early consideration. In anticipation that your Council will receive it favourably, this department would like to hear if it cares to make any proposal for bringing it to the attention of the parties concerned, and for securing its early adoption wherever at all possible.—I am, &c.,

(Signed) F. L. HALFORD.

INSTITUTION OF GAS ENGINEERS.

Notes of the Council Meeting.

A MEETING of the Council of the Institution of Gas Engineers was held last Tuesday.—Mr. A. E. BROADBERRY, the President, in the chair.

The deaths of the following members which had taken place since the last meeting were reported: Mr. J. L. Chapman, of Harrow, Mr. W. Ewing, of Magherafelt, Mr. A. Morton Fyffe, of Blackburn, Mr. F. F. Farrand, of Ryde, Mr. William King, of Liverpool, and Mr. John G. Newbigging, of Manchester. The sympathy of the Council was suitably expressed.

Applications for membership were considered, and the following were approved: As candidates for the class of member: Mr. Charles F. Blincoe, of Middlesbrough; Mr. Henry Kirkham, of New Ross, co. Wexford; Mr. Frederick G. Matthews, of Chertsey; and Mr. Rowland N. Webb, of Leeds. For the class of associate member: Mr. Walter A. Barnett, of London; and Mr. Dennis Hartley, of London. Transferred from class of associate member to that of member: Mr. Thomas F. Canning, of Weymouth; and Mr. Geo. Pearson, of Birmingham.

It was reported that Mr. J. Terrace, of Grimsby, had been appointed District Member of Council for 1917-18, to represent the Eastern Counties Gas Managers' Association.

DATE OF THE ANNUAL MEETING.

Preliminary arrangements for the forthcoming annual meeting were considered. The date fixed upon is Tuesday, June 5; and on the day following, at the invitation of the President, a visit to the Tottenham Gas-Works will take place, to view the entire new section for the production and purification of 4¾ million c.ft. per day, which is now nearing completion.

MISCELLANEOUS BUSINESS.

A report was received from Mr. D. H. Helps, the Institution's representative on the British Association Fuel Economy Committee, indicating the direction in which the work of the Committee was progressing.

Seventeen certificates for gas-fitters were granted on the recommendation of the Manchester District Institution of Gas Engineers and the North of England Gas Managers' Association.

A proposal was received from the Iron and Steel Institute for the formation of a Committee to consider the co-ordination of research work on refractories, and to endeavour, if it seemed desirable, to secure joint action in carrying further the work of standardization. Dr. H. G. Colman and Mr. J. P. Leather were appointed to represent the Institution.

It was decided to apply to the Department of Scientific and Industrial Research for a further grant in aid of the refractory materials research, which is being conducted under the direction of a Joint Committee of the Institution and the Society of British Gas Industries.

A letter from the Institution of Electrical Engineers was considered, inquiring if the Institution had any objection to the publication of the majority report of the Street Lighting Specification Committee, on which the Institution is represented. The Council did not agree with the findings of the report, and decided to request that, if it were published, a statement giving the views of the Institution of Gas Engineers should be appended.

On the invitation of the Engineering Standards Committee, it was decided to appoint a representative on the Sectional Committee on Machine Parts, their Gauging and Nomenclature.

The Publications Committee presented their report, which was adopted.

The Emergency Committee reported that the standard clauses of contract arranged by the Institution and the Society of British Gas Industries had been revised, and that copies would be available shortly.

At the request of the Government Summer Time Committee, appointed to inquire into the social and economic results of the Summer Time Act, 1916, information had been obtained from a number of gas undertakings and sent to that Committee, showing the approximate effect of the Act as regards reduction of consumption for lighting purposes, reduction in the consumption of coal, and the actual saving in expenditure by consumers of gas for lighting purposes. Representatives of the Institution had attended at the Home Office and given evidence on the subject. The Committee's report is in course of preparation, and, it is hoped, will be shortly published.

A communication was received from the National Gas Council, stating that their attention had been drawn to the serious trouble which was being experienced throughout the country from naphthalene stoppages. They were of the opinion that this was a subject for the Institution, and requested that it should receive early consideration. The Emergency Committee, with the addition of Dr. H. G. Colman and Mr. W. Doig Gibb, were asked to consider the matter and report.

THE NEW WAR LOAN.

The Finance Committee's report was presented and adopted. This included the annual accounts for the year ended Dec. 31 last On the Committee's recommendation, it was agreed that a sum of £1000 (including conversion) be invested in the new War Loan. A contribution of £100 was made to the funds of the National Gas Council.

BRITISH COMMERCIAL GAS ASSOCIATION.

Report of the Executive Committee.

A MEETING of the General Committee of the British Commercia Gas Association was held on Monday of last week, when the Executive Committee presented a report, of which the following are some items.

The Association and the gas industry have recently suffered severe loss in the untimely death of Mr. Morton Fyffe, of Blackburn. A message of sympathy has been sent to the Chairman of the Blackburn Gas Committee, to whom the loss has been a personal as well as an official one. The sympathy of the Executive Committee has also been extended to Mr. Thornton, on the death of his brother on active service.

It is satisfactory to be able to report that the list of undertakings giving support to the Association continues to increase in spite of war conditions. Three additions have been made to the list of subscribers since the last meeting of the General Committee.

FINANCE AND POLICY FOR THE CURRENT YEAR.

It is gratifying also to be able to report that subscriptions from undertakings already on the list are coming in satisfactorily in respect of the current year. In the first five months of the financial year, more than 50 p.ct. of the estimated receipts from gas undertakings has been received; and there is every reason to anticipate that the estimated income will be fully realized.

In regard to expenditure, it is proposed to carry forward to the ensuing financial year a sum of £2200. To do this it will be necessary, while keeping the publicity campaign alive, to run it less vigorously for the time being, especially in the newspapers of district circulation, in order not to cause undue embarrassment to undertakings which are not in a position to supply additional apparatus or increased output of gas. As a result of this policy, we should have an additional sum to spend after the conclusion of peace in a specially vigorous revival campaign.

The schedule has also been arranged so as to spend the major portion of what is spent in the periodicals of an educative, rather than of a direct "order-getting," character, so as to be building the foundations for the future rather than attempting to get additional business at the moment. The list of publications appealing to the more thoughtful public and to those who help to mould public opinion has been considerably extended by the inclusion of such periodicals as the "Spectator," "Nineteenth Century," "Quarterly Review," &c.; while all the papers directly appealing to the professional (and especially the teaching) classes have been included.

In the advertisements and in the articles which will appear during the remainder of the financial year, special attention will be paid to the subjects of food and fuel economy. An offer of the hearty co-operation of the gas industry in the campaign for food economy, and the best utilization of all food stuffs we possess (which necessarily includes the question of so cooking them as to secure the maximum nutriment possible), has already been made to the Food Controller, to whom it has been pointed out that there are in the industry a number of fully-qualified women lecturers and demonstrators who have a thorough grasp of food values and the best way of securing them when gas-cookers are employed, so that much might be done to assist him in bringing useful information to the population through the co-operation of the gas undertakings in all the great industrial centres of the country.

It has also been pointed out that the organization of the industry could be used for the distribution of suitable literature (including recipes suited to all classes), to be provided by the Government, in the preparation of which also the Association would be glad to co-operate.

It may be mentioned that in the publicity work done during the

past few months, particular attention has been paid, especially in the papers circulating among municipal authorities, to a popular explanation of the meaning of the Calorific Power Standard Act; and this policy has also been followed in some of the papers of more general circulation.

The final payment has been made in respect of the National Gas Exhibition deficit, and was well covered by the provision in the estimates; the actual payment being £355 19s. 1d. The amount under this heading in the estimates will, therefore, cover also the first subscription of £100 to the National Gas Council, which has already been paid.

Compressed Coal Gas for Motor-Cars.

Mr. J. G. Clark presented a report on such progress as has been made in the investigation into the possibility of using compressed coal gas in place of petrol as a fuel for motor-cars. The investigation is proceeding as expeditiously as possible.

Use of Geysers without Flues.

Steps have been taken in the Technical Press appealing specially to ironmongers, plumbers, surveyors, and architects, to draw attention to the danger of fixing geysers in bath-rooms without adequate flues for the removal of products of combustion.

The Society of British Gas Industries have also communicated with their members, recommending the fixing of metal labels on geysers, clearly stating that it is dangerous to fit such appliances without a proper flue.

The "Multicooker."

It will have been seen from the "Bulletin" that the challenge issued by the Association to the makers of the "Multicooker" was not accepted. After taking the advice of the Association's Solicitors, a pamphlet reprinting the correspondence in "Truth" has been prepared and printed for the use of members of the Association. The activities of those exploiting this apparatus appear to have greatly diminished recently.

Depots for the Supply of Coke to Motor-Wagons.

The question of the formation of coke depots throughout the country for the supply of coke to motor-wagons is now in the hands of the various District Commercial Sections. Useful information on this subject has already been published in the "Bulletin."

The "Cinderella Competition" in Pears' Annual.

A very satisfactory response has resulted from the "Cinderella Competition" published by the Association in "Pears' Annual." A large number of answers were received, and the special Cinderella "A.B.C.," with particulars of a further competition, has been sent to children all over the country—in fact, in many parts of the world. The competition takes the form of a short essay or verses explaining why children should love the Gas Fairy.

Assistance Rendered.

Brief information respecting different points upon which the assistance of the Association has been sought by members since the last report is given in an appendix. Some sixty inquiries are referred to; and the following examples will give some idea as to the variety of subjects dealt with.

Information obtained and forwarded as to the running of aeroplane engines by town gas. Particulars also supplied as to the method of making the necessary connections for using gas.

Suggestions forwarded for the holding of company's staff meetings, with suitable items for profitable discussion.

Information given as to the possibility of the use of gas in connection with photo-lithographic work.

Data supplied with reference to the possible uses of gas in distilleries.

Supplied information as to running petrol engines by gas, together with sketch and particulars of method of making connections.

Particulars obtained of gas-heated apparatus suitable for heating sea water in large quantities.

Supplied information as to the use of gas-heating stoves in a large number of London hospitals. Also recent testimonials received from medical men as to the advantages of gas heating.

Supplied names of makers of gas-heated steam-boilers, and apparatus for jar-drying.

Information given as to practice of gas undertakings regarding the collection of gas and other accounts.

Information given as to the best method of heating by gas a building used as an armoury.

Names supplied of makers of gas-heated water distillers.

Information given as to the course to follow in making application to the Board of Trade as to the adoption of the Gas (Standard of Calorific Power) Act, 1916.

Information supplied as to the practical application of gas for glass making.

Particulars supplied regarding the various uses of gas in the manufacture of asbestos.

Information supplied as to the relative cost of gas and oil for munition making.

Information given as to the use of gas for power in connection with farm work.

Information supplied as to the use of the "pot arch" furnaces in the glass industry; also as to the most suitable method of using gas-heated "skittle" pots.

Information supplied as to the use of gas in hospitals under the control of the British Red Cross Society.

Suggested gas-heated apparatus for the rapid boiling of water for brewing ginger beer.

BENZOL AFTER THE WAR.

With so many plants erected, and being erected or in contemplation, for the recovery of benzol from coal gas, a good deal of consideration has been given to the question of what is likely to be the extent of the demand for this benzol in the happy time when hostilities shall be at an end. Of course, whatever may be the views individually held on the subject, they will not be allowed to influence in the minutest degree the determination to produce the largest possible quantity so long as there is a continuance of the military requirements; but as regards the future, the benzol market is a matter of real importance to present producers. In America, as in this country, there has during the past two years been rapid development of the recovery of benzol from coal gas; but it is thought likely that the advancing price of gasolene would soon have led to a large extension of the industry in the United States, even without the stimulus of war prices.

It seems that, from the close of 1914 to the summer of 1915, the prices of benzol products there rose, with the cessation of foreign supply and the ever-increasing necessities of the munition business, until pure benzene commanded over 80 c. per gallon, and toluene was sold as high as $7 per gallon. Pointing this out, in a paper which he read before the American Institute of Chemical Engineers last month, Mr. F. W. Sperr, jun. (the Chief Chemist of the H. Koppers Company), went on to say that the first complete modern plant for the large-scale production of pure benzene and toluene was put into operation in May, 1915; and the total production of benzol products in the United States that year rose to over 22,000,000 gallons, which was more than twice as much as had been produced the previous year. At the beginning of this year, there were about forty benzol recovery plants in operation in connection with bye-product coking installations; and making allowance for enlargements and the eight new plants now in course of construction, he estimates that the annual production of light oil will be brought up to nearly 50,000,000 gallons. The increase of output, it appears, has been almost entirely in the direction of pure products; the amount of unrefined benzol now being made is thought to be actually less than in 1914. Probably at least 80 p.ct. of the present production is redistilled for the preparation of pure benzene and toluene. A contemplation of these statistics led Mr. Sperr to ask himself, as so many others have done, what is to become of this vast production of benzol after the war; and in his paper he enumerates the factors which seem to him to promise permanent prosperity for the benzol recovery industry.

In the first place, it is pointed out that the use of the benzol group of explosives is by no means confined to military purposes, and that their demonstrated superior qualities should lead to a largely-increased use of them for commercial blasting operations. Then the need after the war of replenishing depleted stores of military explosives is likely to have an extensive influence on the situation; it being one of the peculiar merits of trinitritoluol that it can be stored indefinitely without risk of deterioration. The next direction of usefulness is in connection with the vast development of American chemical industries, which it is asserted ensures a market for large quantities of benzol products to be used for synthetic purposes. Among uses of benzol which are briefly mentioned are in the manufacture of paints, stains, varnishes, and lacquers; in the cleaning industry; in the extraction of grease and fats; as solvents for rubber and for the manufacture of artificial leather and insulating materials; and for "enriching illuminating gas to make it conform with antiquated candle power standards based on the use of flat-flame burners." The last-named, however, is recognized as a dying use, inasmuch as "the utilization of mantle burners and the increasing tendency to replace old candle-power specifications by calorific standards, already universally adopted in more advanced European practice, will doubtless soon do away with the necessity for gas enrichment."

Coming to the employment of benzol as a motor fuel, the author makes a calculation. So far as bulk is concerned, he says, this bids fair to surpass any other possible source of demand. Previous to the war, Germany used over 50 p.ct. of her benzol production for the operation of internal combustion engines; and altogether the demands of the automobile industry alone are so great as to preclude the possibility of any destructive competition between benzol and gasolene. As already stated, the American plants now in operation and in course of construction will be equal to an annual production of about 50,000,000 gallons of benzol; and as there are now over 2,000,000 automobiles in operation in the country, this benzol production would give each machine about 25 gallons. If all the coke that the country now requires were made in bye-product ovens with benzol recovery apparatus, there might be expected a total annual benzol production of about 110,000,000 gallons, or 55 gallons per machine.

In his paper, Mr. Sperr deals at length with the process of benzol recovery; and in discussing the operation of a plant of modern type, he deals principally with the Koppers patented process—this being the one he has specially studied, as typical of modern practice. In fact, to the best of his knowledge, all the coke-oven benzol plants now under construction in America, with possibly one or two exceptions, are of this type. He states that in America the wash-oil generally employed to absorb the benzol is a petroleum product usually known as "straw-oil," of which at least 90 p.ct. should distil between 250° and 350° C. A good absorbent oil has a specific gravity of less than ·88 at 15° C., and is readily fluid at 4° C. In the best practice, the amount of

benzol absorbed is kept between 2 and 3 p.et. of the absorbing oil. It is admitted by him that the heavy tar oils used in European practice may find increasing application in America; and the paper points out that such tar oils should contain less than 7 p.ct. of naphthalene, and 90 p.ct. of the material should distil between 200° and 300° C.

On the subject of prices, the author says that, since benzol is a bye-product of coke and gas making, those items in the cost of its production which are involved also in coke and gas production are not chargeable to the benzol. In other words, the cost of making coke-oven benzol includes only the cost of its extraction from the coke-oven gas, and that of its purification. It is found that, in America, this cost usually lies between 3 c. and 4 c. per gallon. This being so, he is of opinion that, at the close of the war, when prices again become normal, it will be possible, with the large plant capacity then available, to make a substantial profit from the production and sale of automobile 90 p.ct. purified benzol at prices competing with those of gasolene. And besides the other purposes already mentioned, further uses will no doubt be developed as the supply of the material becomes greater.

At the last meeting of the American Gas Institute, Mr. J. W. Shaeffer read a paper [see "JOURNAL," Nov. 21, 1916, p. 397] in which he showed that the effect of the removal of benzol on the calorific value of coke-oven gas was an actual loss of some 5·8 p.ct. This figure, which represents the average practice of about thirty bye-product coke plants, agrees well, Mr. Sperr states, with theoretical considerations; and on it he bases the following calculation: Assuming that a ton of coal makes 11,000 c.ft. of gas, a reduction of 5·8 p.ct. is equivalent to 638 c.ft. less gas. As boiler fuel, this gas is worth about 6 c. per 1000 c.ft.; so that the reduction may be taken to cost about 3·83 c. per ton of coal, or about 8 p.ct. of the normal value (based on gasolene prices) of the total benzol recovered from a ton of coal.

The Reports of Proceedings of Gas Associations.

The reports in combined book form of proceedings during 1916 of the various Associations of Gas Engineers and Managers of the United Kingdom—an advertisement relating to which will be found elsewhere in this issue—have now been published; and it may be said that they make a volume of 600 pages. This is very considerably more than the space occupied by the proceedings for the year 1915; but that was a period of greatly curtailed activity in Association matters—the Irish Association, for instance, held no meeting at all during the year. With regard to the present volume, the outstanding feature will probably be considered the information which it contains on the subject of benzol and toluol extraction. The papers and discussions on this matter are a sign of the troublous times in which we live, though their usefulness should not be confined to the existing situation. The price of coal, the carbonization of pitch, and the effect of war on gas-works practice are other topics which the economic position consequent on the struggle with Germany has brought to the front. That it should have been possible for the material for such a volume of "Transactions" to be provided by the members of the industry at such a time, with difficulties of various kinds, and of disconcerting intensity, to be overcome, will certainly cause a feeling of surprise when in after-years the contents of the book are studied. The conclusion at which the student will probably arrive will be that the work furnishes abundant proof of the vitality of the gas industry, just at a time when this vitality, from a national point of view, was imperatively needed. The book has for so many years formed part of the gas manager's library that it is no doubt totally unnecessary to say that the reports are reprinted from the pages of the "JOURNAL;" their re-arrangement all together in this form rendering the proceedings at the different meetings far easier of reference than could otherwise be the case.

At a meeting of the Midland Junior Gas Association to be held on Thursday evening in the Reading Room at the Council House, Birmingham, a paper on "New Methods of Measuring Gas under Varying Conditions of Temperature and Pressure," will be read by Messrs. C. M. Walter, B.Sc., and R. G. Marsh, of Birmingham. The paper will be illustrated by lantern slides.

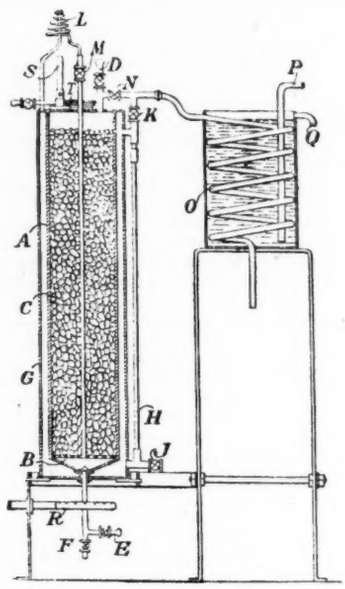
For the paper which he read in the early part of last year before the Society of Engineers, on the subject of "Modern Coal and Coke Handling Machinery as Used in the Manufacture of Gas," Mr. J. E. Lister, Wh. Ex., Assoc.M.Inst.C.E., Assoc.M.Inst. Mech.E., has been awarded by the Council the Nursey Premium, value £3 3s. The main portions of the paper will be found in the "JOURNAL" for April 4, p. 30.

The fourth meeting in the present session of the Scottish Junior Gas Association (Western District) will take place in the Royal Technical College, Glasgow, on Saturday of this week, when Mr. Reginald Cross, of the Tradeston Chemical Works, will deliver a lecture on "Tar." A visit to the Hamilton Gas-Works (where extensive reconstruction work has recently been carried out) has been arranged for the 24th inst.

LESSING'S APPARATUS FOR EXTRACTING VAPOROUS CONSTITUENTS FROM COAL GAS.

It may be recalled that, at the January meeting of the Society of Chemical Industry [*ante*, p. 159], Dr. R. Lessing gave a brief account of an appliance he has devised primarily for facilitating the extraction of benzol and toluol from coal gas.

In their last Friday's issue "Engineering" were able to give further particulars as to the construction and use of the plant—saying: Dr. Lessing recommends "dry scrubbers," charged with a solid absorbent material, which he impregnates with some oil. His second chief point is that he removes the absorbed vapours by distillation (with the aid of steam) *in situ*, without transference to a still. The method was suggested to him, some years ago, by the observation that spent iron oxide from gas-works absorbed hydrocarbons and carbon disulphide owing to the tarry matter and sulphur in the oxide. The absorptive power for hydrocarbons was indefinite, however, and the spent oxide induced chemical side-reactions. Dr. Lessing then experimented with pitch crushed to pea size. But the pitch started running; and the passages between the grains became clogged. From a material of high viscosity like pitch he, therefore, turned to oils of low viscosity incorporated into highly porous inert materials which would retain the



oils, and not allow them to be thinned unduly and washed-out by the solvent vapours they absorbed. The absorbent oil was thus to remain quiescent, and to behave as a solid so far as contact with the gas and the formation of back-pressure was concerned. The back-pressure is a feature of some importance.

The inert material used, Dr. Lessing explained, consisted of broken brick, or preferably of moulded pieces of highly porous material. The oil was green oil or gas oil. The gas was passed through a closed vessel or "scrubber still" packed with the material; and when the absorption was complete, the valves were closed, and the gas current was directed into a second similar vessel. Superheated steam was then blown through the first vessel, which was jacketed. As the oil formed a very thin film exposed to the steam, it was not necessary to raise the whole mass to the steam temperature. The steam carried the vapour over into a condenser and a receiver, fitted with overflow pipes for crude benzol and for water respectively. Three such stills were combined for scrubbing, steaming, and cooling—in rotation. The labour involved was restricted to manipulating the valves and collecting the distillates. There were no pumps or moving parts; steaming was not required for more than short periods once every twenty-four hours or more; and little floor-space was taken up by the plant. In the ordinary scrubbers any thickening of the oil was a disadvantage, as the increased viscosity prevented contact between the vapours and the fresh absorbent. When the oil was absorbed by porous bricks, the thickening of the thin film by the absorbed vapours was rather an advantage, as the more viscous oil would be more readily retained by the pores. As regards the time of contact necessary to ensure efficient absorption, the dry scrubber was also superior to the irrigated (spray) scrubber and to the bubbling apparatus, as the oil locked up in the dry scrubber had a chance to saturate itself with the vapours.

"Engineering" illustrates the very neat apparatus with which Dr. Lessing has been experimenting during the last two years, in his own laboratory, and also in several gas-works. The oil-soaked material rests on the perforated bottom B of a cylindrical

container A. The gas enters through the stopcock D, and passes downward through the material and through the outlet E into the gas-meter, which Dr. Lessing prefers to arrange after the scrubber, in order to prevent condensation of vapour in the meter itself. The gas leaving the meter is tested. A convenient check is kept on the operation by lighting jets both of the unstripped and the stripped gas. The former gives a luminous, the latter a blue non-luminous flame. Rough photometer estimates can also be made. During the scrubbing period the container jacket G, which is provided with a gauge H, and a drain cock J, is charged with cold water. Gas is passed through the scrubber at the rate of 5 c.ft. per hour, and the 100 c.ft. needed for an experiment will thus be dealt with in about twenty hours. The absorption period completed, the cocks E D are closed; K is opened; and the water-level in the jacket is lowered through J to about one-third. The ring-burner R, which heats the jacket, is now lighted, and steam is raised in J, the excess of steam escaping into a condenser O. When the water is well boiling, K is shut, while M and N are opened, and the small burner S under the superheater coil L is lighted. The steam then passes from the jacket through L and M into the container and up through the material—escaping together with the vapours liberated through N into the condenser, which is cooled by water entering at P and overflowing at Q. The charging-hole T on the top of the container is closed by a screw cap. The drain cock F removes water condensing in the apparatus and any surplus oil. The distillation is continued until the absorbed naphthalene has been distilled-over. This takes about an hour. The distillate obtained, amounting to 100 or 200 cub.cm., is separated from the water and further examined by any convenient method of fractionation or chemical analysis, &c.

Our contemporary's interesting article concludes: We stated already that this apparatus has been found very convenient for controlling washing operations in works laboratories; and it is being made for this purpose by Messrs. Alexander Wright & Co. The best, long-known method available for such purposes—freezing-out condensable hydrocarbons and fractional distillation—has been amplified recently and taken up by the Bureau of Mines and others. But these methods are more suited for research, and require skilled manipulators; and there is another aspect to this matter, to which Dr. Lessing referred. At present gas undertakings supplied a more or less considerable percentage of inert gases (nitrogen and carbon dioxide) with their product, and this deadweight has to be compensated for by enriching the gas with compounds of higher calorific and illuminating values. By studying the compounds of this kind "naturally" present in the gas when leaving the retort or the superheater (in the case of water gas) it should be ascertained which of these compounds was economically the more and the less important; and it would probably pay to extract the gas exhaustively and to either reincorporate with it hydrocarbons of lower value for other purposes, or else to replace part of the extract by cheaper-grade petroleum distillates or cracked spirits. Signs were not wanting, however, that a gas free of inert gases might, in the near future, be obtained from coal. The demand for further analyses and a further study of the mechanism of carbonization and after-treatment of the gas was thus becoming more urgent, and even now a detailed examination was essential, for which ready methods were hardly available.

The "Cheap" Mantle.

The "American Gas Engineering Journal" remarks that the primary interest of gas undertakings in the lighting business is the sale of gas; and they should leave no stone unturned that would promote this object. "Cheap" mantles are to blame for the fact that gas lighting does not enjoy the full measure of repute to which its merits are now entitled. The popularity of the cheap mantle is due to the fact that the retail seller does not want mantles to last too long; and the purchaser looks at the price, irrespective of any other consideration. Among the suggested remedies for this state of things are that the public should be educated, by advertisement and otherwise, to appreciate quality rather than price, and that the retail dealer should be entirely eliminated. The gas company should monopolize the mantle business, and take care to supply only those brands that have been proved by expert decision to represent the greatest degree of durability and efficiency obtainable. The result would be an increase in the quantity of gas consumed for lighting purposes, a maximum duty from each cubic foot of gas, but not a larger consumption of mantles per burner. In America, the public prefer inclusive charges; and if the cost of burners, mantles, and maintenance was included in the lighting rate, even in the face of cheap mantles at retail shops, the gas company would get the business, the consumer the service, the lighting department the credit (as evidenced by increased sales of gas), and manufacturers of really good mantles would do a larger trade than they ever did before.

The Illuminating Engineering Society meet at the Royal Society of Arts at 5 p.m. next Tuesday, when a paper on the "Effect on the Eye of Varying Degrees of Brightness and Contrast" will be read by Dr. James Kerr, of the Public Health Department, London County Council.

YORKSHIRE JUNIOR GAS ASSOCIATION.

A Discussion Meeting.

A meeting of the Association, the object of which is to encourage members to join in discussion, has been arranged for next Saturday afternoon in the Gas Department Show-Rooms, Darley Street, Bradford. The following list of questions has been drawn up, and will be submitted to the meeting; the number to be dealt with depending upon the time taken up in discussion. As the Press will not be represented, it is hoped that members will not hesitate to express their views freely.

1.—What is the best method of introducing paraffin into gas leaving the works, to prevent naphthalene trouble?

2.—What is the best method of clearing services stopped by naphthalene?

3.—What is the cause of the thickening of wash-oils employed in benzol plants—direct heat or steam distillation? Which is the better method for the valuation of a creosote oil—the viscosity or the specific gravity?

4.—What is the best method of connecting steam supply into holder-cups to prevent freezing in frosty weather?

5.—Is an "all gas" house a practicable proposition? Has it any limitations?

6.—What is the cause of the presence of water in the bottom of purifier-boxes, and what is the remedy?

7.—What is the cause of stiff tar from the hydraulics in the tar-main?

8.—Would it be profitable for a medium-sized works of (say) 50 millions per annum to adopt the backward rotation system of oxide purification?

9.—Oil-washing for the recovery of 65 p.ct. benzol. After allowing interest and sinking fund (redemption) maintenance, and running costs of a benzol plant, and assuming that the whole of the profit were returned to the consumer in the form of a reduction in the price of gas, how would the consumer's gas bill be affected? Would he, under the changed conditions of supply, pay more than formerly for a given amount of light, heat, or power?

10.—Should efficiency tests of gas appliances be calculated upon the net or gross calorific value?

11.—Which is the correct place to govern—at the meters or appliances?

12.—Is the welded joint preferable to the rigid lead joint for low-pressure steel mains?

13.—In shutting-down a setting of retorts, is it better to leave in the coke until the retorts are cold, or to draw the coke while the retorts are still at a red heat?

14.—Can a gas having 10 to 20 p.ct. nitrogen have from 14 to 18 candle power and from 550 to 600 B.Th.U., and, if so, under what conditions?

15.—What use are regenerators? Has a regenerator setting any real advantage over the generator setting? Have any tests been made to show the amount of heat lost in heating-up air which subsequently short-circuits to the waste-gas flues? Is there such a thing as a bottle-tight regenerator? What is the modern tendency in the designing of regenerators?

16.—Assuming that a grate area of 1½ sup. ft. is allowed (as it was in olden days) for each single (10-ft.) retort working on light charges, what area is necessary for a producer which has to supply a modern bed of "eights" or "tens" (20 to 22 ft. retorts), working on full charges of approximately 20 cwt.? How would you obtain this area? What width, what depth from back to front would be required, and what space would be left for producer walls and regenerators?

PRESENT AND FUTURE OF ARTIFICIAL FERTILIZERS.

A Meeting of the London Section of the Society of Chemical Industry, held on Monday of last week, Dr. E. J. RUSSELL, Director of the Rothamsted Experimental Station, read a paper on "Artificial Fertilizers: Their Present Use and Future Prospects," in which naturally there were many references to sulphate of ammonia.

After stating the uses of superphosphate—primarily for root crops, grain, cotton, and indigo, and its detrimental effect on the sugar cane, and the great advantage of basic slag as a dressing for grass land—Dr. Russell passed on to deal with nitrogenous manures—viz., the nitrates of soda, lime and ammonia, sulphate of ammonia, and cyanamide or nitrolime. Nitrate of soda was pre-eminent as a quick-acting, emergency manure; and, on this account, Dr. Russell thought that it would always be given a preference by English agriculturists, despite the fact that it left some of its soda in the soil in the form of sodium carbonate, which rendered clay soils sticky and deflocculated. Nitrate of lime had not this fault; but being deliquescent it was troublesome to store and handle. Nitrate of ammonia injured the leaves of the young plants, and could not be applied without great loss at an earlier stage. Sulphate of ammonia had not these faults; but as it had to undergo oxidation before becoming available for assimilation by the plant, it had to be applied to the soil at an earlier stage than the nitrates.

For sub-tropical climates, sulphate of ammonia had the great advantage over nitrate of soda that it was adsorbed; and consequently it was not washed out of the soil by heavy rainfall, as

was the case with nitrate. Sulphate appeared also, upon other grounds, to give better results than nitrate with the sugar cane, for which it was pre-eminently the best fertilizer. Sulphate also gave much better results on the swamps on which, in Japan and elsewhere, rice was largely grown. This was due to the fact that anærobic organisms present in such swampy soils seized the oxygen of nitrate, reducing that salt to nitrite, which was of little manurial value, or to nitrogen, which was valueless. Sulphate of ammonia was not destroyed by these organisms, and consequently produced excellent crops of rice. Speaking generally, Dr. Russell thought nitrate of soda would continue to be preferred by the English farmer on account of its quick effect. In this climate he thought that sulphate had, per unit of nitrogen, only about 90 p.ct. of the effect of nitrate on plant growth; but in sub-tropical climates sulphate had a great advantage over nitrate.

The total world's output of sulphate of ammonia, which in 1903 was 500,000 tons, had increased by 1912 to 1,500,000 tons, and the consumption showed every likelihood of still further increasing. In 1903, Germany's output in metric tons was 160,000; but this had increased by 1912 to 492,000 tons. On the other hand, the output in Great Britain, which was 237,000 tons in 1903, had only increased to 394,521 tons in 1912; so that we had dropped to second place during the period in question. The demand throughout the world, however, had increased faster than the supply, with the result that prices had rather tended to rise. In 1912, we used in this country about 60,000 tons of sulphate of ammonia for the land; but a large proportion of our output had been exported. The possibility of considerably increasing the output, however, had received much attention as the result of the war; and its use was likely to increase very considerably.

The discussion on Dr. Russell's paper was merged into that of a paper by other authors, on basic slag. The principal comments on Dr. Russell's paper were made by Dr. Voelcker, the Chemist to the Royal Agricultural Society, who said he had hoped the author would have told them something as to the farmer's prospects of obtaining artificial fertilizers at all at the present time. He thought that Dr. Russell had laid too much stress on the emergency value of nitrate; and that the farmer should rather be encouraged to use sulphate in good time as a matter of course. He thought also that the value of nitrate relative to sulphate had been over-rated by the author. Mr. W. J. A. Butterfield, after some remarks on a possible new source of potash for manurial purposes, inquired how it was that, if sulphate underwent oxidation in the soil before its nitrogen became available to plants, it escaped the destructive influence of the anærobic organisms in the soil of the rice-growing swamps of Japan. Dr. Russell, having had to leave the meeting earlier in the evening, did not reply at the time to the discussion.

The Derby Gas Company's New Showrooms.

Referring to the illustrated article which appeared in the "JOURNAL" for Jan. 2, p. 18, dealing with the new showrooms recently opened by the Derby Gas Light and Coke Company, we are asked to mention that the unique and much-admired decorative work and general fitting-out of the premises were dealt with exclusively by the Nautilus Fire Company (now owned by the Davis Gas-Stove Company), who were responsible for the conception of the entire scheme, and therefore for the many artistic features embodied in it.

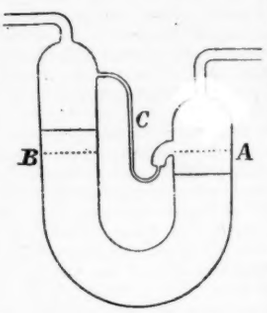
Research in Glass and Optics.—A standing Committee on glass and optical instruments has been established by the Government Department of Scientific and Industrial Research. The Chairman is Prof. H. Jackson; and among the members is Prof. C. V. Boys, F.R.S., and Dr. R. T. Glazebrook, F.R.S.. Sub-Committees have been appointed to deal with special problems, including raw materials for glass and glass-making. Manufacturers who have experienced difficulties requiring investigation for their solution in connection with glass and optical instruments, or who desire to make suggestions for special researches on these subjects, are invited to communicate with the Secretary of the Research Department, Great George Street, S.W.

Gas Power for Lancashire and Yorkshire Mills.—The possibilities of extending the use of gas for the Lancashire spinning and weaving mills and the Yorkshire woollen industry are suggested, writes a correspondent, by the difficulties that are constantly met with owing to the shortage of electricity in many districts. At Rochdale, for instance, though there has been an improvement in the supply of current to various mills which have been stopped owing to the shortage of electricity, the difficulties are by no means over; one of the largest cotton mills (chiefly on Government work) having only half their spinning and a small part of their weaving machinery running last Wednesday, while several other manufacturers reported that they were getting only one-half their usual supply. A somewhat similar state of things was reported at Accrington the previous day. Some time ago, says this correspondent, the members of the Textile Institute devoted considerable attention to the question of gas-driving in cotton mills; and it was then anticipated that a forward movement would be made by gas undertakings to capture the trade. But of late the matter has been neglected altogether.

A LABORATORY GAS-METER.

A communication on this subject, made by Mr. A. E. Beckett to the Glasgow Section of the Society of Chemical Industry, appears in the current issue of the Society's "Journal."

The author pointed out that it is often of interest to know the rate of a stream of gas employed in a laboratory operation; and the following device has been found by him to be useful for this purpose.



As shown, the apparatus is filled up to the dotted line AB with water, which thus fills the syphon C, connecting the two limbs of the U-tube. When the gas to be measured enters the apparatus, it forces the level of the water down in A and up in B, until the difference in pressure causes the syphon to empty itself into B. The gas that is in A then escapes into B through the syphon; while the level of the water readjusts itself in the U-tube and fills the syphon. The process then starts again. The syphon runs over each time after a definite amount of the gas has passed through the instrument, which amount, however, varies with the velocity of the gas. A determination of the capacity of the meter for different velocities of gas gave the following results:

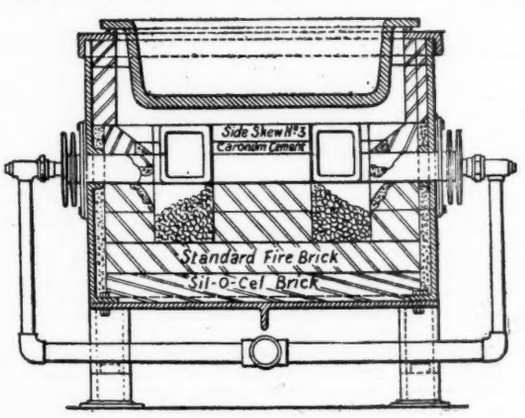
Rate per Second.	Capacity.
c.c.	c.c.
15·5	44·5
10·0	42·5
7·61	40·5
6·56	40·0
3·75	37·5
1·93	36·5
0·54	35·4

As this syphon gas-meter is made entirely of glass, it may be used for any gas which is slightly soluble in water or in the liquid used. If a constant stream is desired, gas at high pressure should be employed, and the rate regulated or throttled immediately in front of the meter. For gases very soluble in water, other liquids have to be used, but only mobile liquids can be employed.

SURFACE COMBUSTION LEAD MELTING.

The heating of metal for electrotype work in America has recently had surface combustion adapted to it, as it has been to other phases of the soft metal melting industry; and this method of treating lead has been briefly described by Mr. H. L. Read, of the Surface Combustion Company, Long Island City (N.Y.), to the "American Gas Engineering Journal."

From the designer's point of view, Mr. Read says, little variation from accepted procedure was required other than certain changes



Section of Furnace.

in dimensions to accommodate the pans. These, of course, have to be capable of insertion into the pot, which consequently must be properly shaped. Experience has shown that a rectangular pot about 33 in. × 23 in. × 7 in., inside measurements, gives many advantages. Apart from the structural alterations necessary to support such a vessel, the design of a surface combustion furnace for the purpose under discussion differs in no essential from that of the more usual circular devices from which melted lead is re-

moved by dipping, by pumping, or by opening a gate connected to the lower part of the container.

The burners are fed from pipes dropping vertically down and running back underneath the appliance, where they join the main mixture-pipe. Air at a pressure of about 1¼ lbs. per sq. in. is supplied to the mixing chamber through a cock which is the means of controlling the mixture; since, in this system of gas application, the gas is automatically proportioned to the air. In other words, when the air-valve is opened wider, more gas enters with the increased amount of air; and as the air-valve is closed-down, less gas is admitted. The correct amount of gas and air for complete combustion without excess of either is always passed, with the volume of the mixture depending on the position of the air-cock. In the illustration the burners and refractory bed are shown, along with two rectangular openings in the upper part, which are lighting-holes.

At the time of installing of this furnace, some tests were run to demonstrate to the consumer the economy of operation. These are summarized:

Lead Melting Tests.

Temp. deg. Fahr.	Cold lead added per hr.	Hot lead returned per hr.	Total lead per hr.	No. of pans per hr.	C.ft. o. gas per hr.	Duration of test.	Lbs. lead per c.ft. gas.
750 . .	451 lbs.	271 lbs.	722 lbs.	12	250	2 hrs. 13 min.	2·89
730 . .	162 lbs.	382 lbs.	544 lbs.	13	200	3 hrs. 43 min.	2·72

Three tests were then run to determine the amount of gas required to maintain given temperatures with no work being done.

Temp. deg. Fahr.	C.ft. gas per hr.	Duration of test.	Lbs. lead in pot.
850 ..	100 ..	30 min. ..	1000
835 ..	95 ..	51 ,, ..	1800
750 ..	70 ..	30 ,, ..	1650

BACKWARD ROTATION SYSTEM OF PURIFICATION

In the American "Gas Institute News," Mr. O. W. Adams, the Gas-Works Superintendent at Holyoke (Mass.), contributes a "wrinkle," in which he states that his methods of purification consist in adding, at the inlet of the purifiers, the proper complement of oxygen as air to combine with the sulphuretted hydrogen present in the gas. The reaction does not take place directly, nor will it do so until the bulk of the sulphuretted hydrogen has been removed. Apparently no revivification occurs in the first and second boxes in the series, but will take place in the third and fourth. He tried the usual method of reversing, 1, 2, 3, 4 to 4, 3, 2, 1, but did not find it a success, possibly because he had no catch-box.

The system that he had adopted was to start with 1, 2, 3, 4. The gas at the inlet of No. 1 showed 250 grains of sulphuretted hydrogen per 100 c. ft., and a foul test at the outlet of No. 3; the last box being clean. After a week's work with the appropriate quantity of air, No. 3 showed a clean test. He then changed to 4, 1, 2, 3; and after a second seven days' work, No. 2 gave a clean test, and he changed to 3, 4, 1, 2. He had followed this plan of weekly changes since June 8, and had not required to turn off a box, and probably would not have to do so until the purifying material was saturated with sulphur.

If he was running straight coal gas, which would mean 400 grains of sulphuretted hydrogen per 100 c.ft., he would add at least 2 per cent. of air to get sufficient oxygen to satisfy the theoretical requirement, and practically have as much sulphur as sulphide in the last two boxes as was deposited in the first two. The extra amount of nitrogen did not make any great difference in the photometrical value of the gas, though he did not know the effect on a lower quality of gas, or of a larger percentage of air.

The illustrations accompanying the text show a set of four purifiers of circular section, mounted on pillars and girders at an elevation of 10 ft. above the ground level, each box being about 20 ft. in diameter and 11 ft. 6 in. deep; but no indication is given of the quantities of gas dealt with. The method possesses the advantage of not requiring any special arrangement of valves, apart from the usual provision for working in series.

Exhaust Steam for the Generation of Carburetted Water Gas.—The Baltimore Gas, Electric Light, and Power Company have substituted exhaust steam for live steam in their water-gas house. Mr. George Beadenkopf, the Chief Engineer of the Company, writing to the "Baltimore Gas and Electric News," says that hitherto the low-pressure Sturtevant type of fan has been used for producing the blast, and live steam direct from the boilers for the blue gas. A new system, just put into operation, includes four Sturtevant No. 7 extra heavy multivane pressure type of blowers, capable of discharging 20,000 c.ft. of air per minute, under a 40-in. water pressure, each driven by a 200 B.H.P. Lee steam-turbine, the exhaust from which supplies the steam required for the production of water gas. This new system of high blast and exhaust steam materially increases the productive capability of the plant.

CORRESPONDENCE.

[*We are not responsible for opinions expressed by Correspondents.*]

The Settle-Padfield Retort and the Vertical Retort System.

SIR,—The allusions to the genesis of the vertical retort as now generally adopted in large gas-works, made by Prof. Henderson in the course of a lecture to the Scottish Junior Gas Association, a report of which appeared in the "JOURNAL" for Jan. 30, p. 213, can only be explained by assuming ignorance or forgetfulness, on the part of the speaker, of the extensive researches carried on at Exeter in 1903 and 1904, in connection with the Settle-Padfield process.

This is remarkable, not only because full details were supplied to the "JOURNAL" at the time, and reproduced therefrom by several chemical and scientific journals, but were also repeatedly quoted by Prof. Vivian B. Lewes, both in lectures and publications. They constituted the first attempt in the way of a systematic investigation as to the prospects of vertical and continuous distillation of coal in the ordinary gas-works, and went far beyond a mere imitation of the shale distillation practice, which, in fact, was of very little assistance. They included not only the working results to which the capabilities of the average gas engineer are confined (in the opinion of certain University professors), but analyses and other details usually associated with the work of the chemist. The chemical aspect of the question was fully appreciated and represented, and the experiments set out a result, both in candle and calorific units per ton of coal carbonized, that has not yet been equalled in practice.

Prof. Henderson's references to the origin of the vertical retort are as unfortunate as are those to other matters, on which the best available chemical skill has repeatedly been consulted; and the spade work which practically constituted the inauguration of the system as now applied cannot correctly be described as a Topsy-like growth, or a development mainly from the engineer's point of view, although the ultimate practical and commercial development of this, as of most other improvements in the manufacture or purification of gas may usually be traced to suggestion based on small-scale experiments as a start, followed by tests on a working scale, and finally the design by engineers, and the construction of apparatus suited to work the process to the best advantage.

Gas engineers have lately been favoured with a considerable amount of "music" to the tune of "ignorance and consequent neglect of chemistry"—largely due to lack of acquaintance with the work that has actually been accomplished within the last twenty or twenty-five years. The fact is that the pioneers of successful improvements have been better aware of the position and possibilities of chemistry than the critics who refer to an unscientific industry; and no one acquainted with the labours of the late Sir Corbet Woodall, Sir George Livesey, Mr. Thomas Newbigging, and other builders of the gas industry as it at present exists, will concede that these gentlemen were deficient in scientific knowledge, not fully informed as to the position of the chemist, or did not freely avail themselves of the best chemical advice obtainable, whenever any advantage was attainable by that course of action.

It would be unjust to close this protest without a passing reference to Mr. Thomas Settle—especially as he has never reaped any adequate return for the immense amount of zeal and energy with which he attacked the problems of vertical distillation and continuous charging; the real extent of his labours being only fully known to those who had the privilege of intimate association with the Exeter experiments.

Salisbury, Feb. 5, 1917. N. H. HUMPHRYS.

Gas Affairs at Oldbury.

SIR,—With reference to the paragraph on p. 264 of your issue of the 6th inst., "Oldbury Gas Output," the figures which your local representative has apparently extracted from the usual monthly report to the Council are for a portion of the financial year only.

The debenzolizing plant to which reference is made will, I hope, be working in about a fortnight's time.

CHARLES H. CARDER,
Engineer and Manager.
Oldbury, Feb. 7, 1917. Urban District Council Gas Department.

REGISTER OF PATENTS.

Discharging and Charging Machines for Gas-Retorts.—No. 103,143.

GUEST, A. A., GIBBONS BROTHERS, LTD., and WIGLEY, J., of Dibdale, Staffs.

No. 432; Jan. 11, 1916.

This invention refers to machines for discharging coke from one end of a double-ended horizontal retort and for charging in coal at the other end—the two operations being performed during one combined forward and backward movement of the discharging-charger. The main object of this invention is to provide a machine which will fill the retort, if necessary, right up to the crown.

The patentees point out that it has previously been proposed in charging and discharging apparatus to employ a jointed sectional conveyor trough adapted to be pushed into the retort and having at its front end a hinged pusher-head adapted to discharge the coke from the retort; the trough having combined with it a screw or chain conveyor inside the trough and adapted to convey along it a charge of coal supplied through a telescopic feed tube from hopper to trough. Mechanism

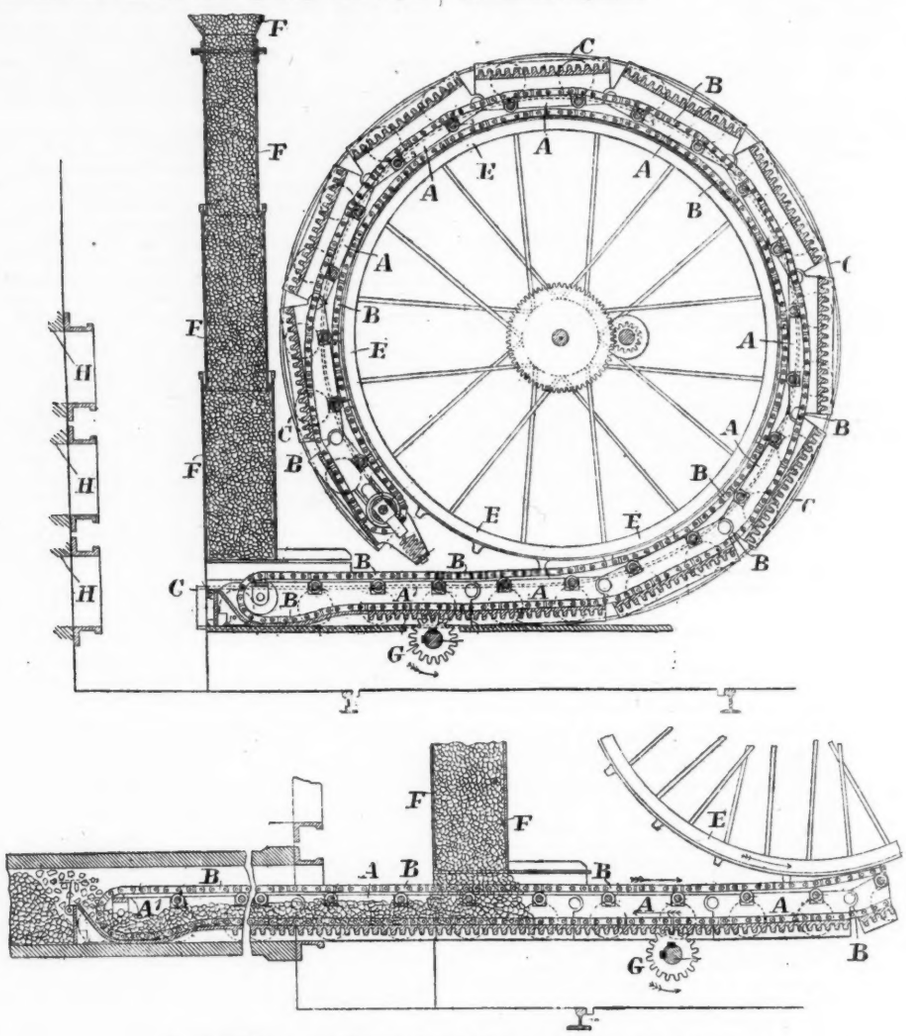
is provided for operating the trough and conveyor so that the coal is supplied to the trough while it is being inserted into the retort for the head of the trough to eject the coke from the retort; while on the return of the trough the screw or chain conveyor is operated to eject the coal from the trough under the pusher head, and so to lay the coal in the retort. It has also been proposed for the trough and the screw conveyor to be continuous or in sections on a shaft; and when a chain plate discharger is employed, the conveyor trough would be hinged so as to allow of its end being turned upwards in small alleys.

According to their present invention, a combined jointed sectional conveyor trough and discharging ram carries an endless drag bar chain adapted to travel along the bottom of the trough and passing round rollers at the ends of the trough—the upper part of the drag bar chain travelling over rollers carried by the sides of the trough. The sections of the combined trough and discharging ram are guided by having side rollers running in channel guides which extend backwards from near the mouth of the retort and then rise and are curved over in a sprocket wheel which gears with the drag bar chain, and is driven so as to cause the chain to travel in the trough. The trough with the chain passes under a feed spout conveying coal to the trough—the coal passing through the drag bar chain on the return falling into the trough so as to be carried forward at the proper times by the lower part of the chain travelling along the bottom of the trough. The trough sections are made with toothed racks gearing with a spur pinion on a driving shaft for the purpose of moving the combined trough and discharging ram and endless drag bar chain forward into the retort, and for withdrawing it.

The discharging of the retort is effected by the forward movement into the retort of the combined trough and discharging ram with the drag bar chain—the ram head acting against the coke and pushing it out of the retort. On the completion of the discharging movement, the ram head is at the far end of the retort. The coal is now fed from a spout into the trough, falling past, and between, the bars of the upper portion of the drag bar chain on to the part of the chain at the bottom of the trough. The drag bar chain is then set in motion, conveying the coal along the bottom of the trough to its forward end, where it is projected over the ram head or discharging head against the crown of the retort, thereby filling it. As the retort fills, the combined conveyor trough and discharging ram is slowly withdrawn in accordance with the rate of filling or weight of charge required.

A part sectional side elevation is given of the main portions of the machine—the parts being shown in the positions they occupy when out of operation. There is also a part sectional side elevation of certain portions of the machine represented in operation charging coal into a retort.

A is the combined jointed sectional conveyor trough and discharging ram referred to above, and B is the endless drag bar chain adapted to travel along the bottom of the trough in the direction of the arrows, and passes round rollers in the ends of the trough—the upper or return part of the drag bar chain travelling over rollers carried by the sides of the trough. C are the two channel section guides, fixed with their faces opposite one another and far enough apart to allow the charging trough to pass between them. The guides extend backwardly from near the mouth of the retort H, and then rise and are curved over in a circular form round a large sprocket wheel E, the teeth of which gear with the drag bar chain. Each of the trough sections has side rollers—preferably two on each side—which engage in the channel guides C. F is the vertical feed spout conveying coal from an overhead hopper to the trough, and under which the trough with the drag bar chain passes. The coal from the spout passes through the upper or return part of the drag bar chain and falls into the trough, so as to be carried at the proper times by the lower part of the drag bar chain which travels along the bottom of the trough. G is a spur pinion gearing with toothed racks fixed to, or formed on, the bottom of the trough sections for the purpose of moving the combined trough and discharging ram and endless drag bar chain forward into the retort and for withdrawing them.



Guest, Gibbons, and Wigley's Retort Charging-Discharging Machine.

The sprocket wheel E, round which the return part of the drag bar chain passes, is driven by a spur wheel and spur pinion; the latter mounted on a driving shaft which, through suitable reducing gear, is driven from an electric motor in one or the other direction. The driving gear, however, forms no part of the invention. The shaft on which the spur pinion G is mounted can also be driven from reducing and reversing gear from an electric motor.

The parts of the machine above described are mounted on a carriage as in other retort-charging machines, and furnished with mechanism for raising, lowering, and travelling along rails on the retort-house floor, so as to suit the various retorts.

When using the apparatus, the discharging of the retort is first effected by moving forward into the retort the combined trough A and discharging ram and drag bar chain—the ram head acting against the coke and pushing it out at the other end of the retort. During this movement, the drag bar chain remains practically stationary as to the trough sections A; and the clutch in the driving gear of the sprocket wheel E is thrown out so as to permit of the wheel being turned freely on its axis by the fact of the upper or return part of the drag bar

chain gearing with the teeth of the wheel. During this movement, a sliding shutter at the bottom of the coal-shoot F is closed. On the completion or thereabouts of this discharging movement, the ram head will be at the far end of the retort, and the turning movement of the pinion G has ceased. The sprocket wheel E is now caused to revolve in the direction of the arrow, so as to cause the drag bar chain to travel forward along the bottom of the trough and back again over the rollers. The sliding shutter is withdrawn—or this can be withdrawn on the commencement of the turning movement of the sprocket wheel E—so that the coal from the shoot F drops down through the return portion of the drag bar chain on to the lower portion of the chain on the bottom of the trough, and is thereby carried forward to the front end of the trough, where the coal is projected over the top of the discharging head against the crown of the retort. As the retort fills, the combined conveyor trough and discharging ram is, by the pinion G, slowly withdrawn.

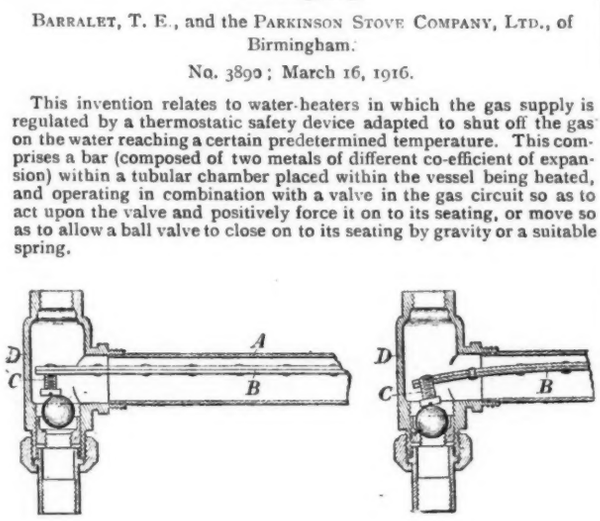
When the retort is not required to be quite filled with the charge, a horizontal deflecting plate (see dotted lines) may be attached to the upward prolongations of the sides of the front section A^1 at a short distance above the swinging head of the discharger at the level to which the retort is to be filled, so that the coal will, by the drag bar chain, be projected upwardly against the underside of the plate, instead of being projected against the crown of the retort, and the plate will thus regulate the level of the charge in the retort.

Thermostatic Safety Device for Geysers. No. 103,213.

BARRALET, T. E., and the PARKINSON STOVE COMPANY, LTD., of Birmingham.

No. 3890; March 16, 1916.

This invention relates to water-heaters in which the gas supply is regulated by a thermostatic safety device adapted to shut off the gas on the water reaching a certain predetermined temperature. This comprises a bar (composed of two metals of different co-efficient of expansion) within a tubular chamber placed within the vessel being heated, and operating in combination with a valve in the gas circuit so as to act upon the valve and positively force it on to its seating, or move so as to allow a ball valve to close on to its seating by gravity or a suitable spring.



Barralet's (Parkinson Stove Company) Thermostat.

A sectional plan is given of the safety device, both in its open and closed position.

A copper pipe A is arranged to pass through, and be heated by, the water in the apparatus. The pipe is closed at one end and contains within it a thermostatic device comprising a bar B formed of two riveted-together metal strips having different co-efficients of expansion—for example, one strip being of iron and the other of aluminium. One end of the device is fixed within the tube A, while the other end is free to move; so that on the device being heated by the water the aluminium will expand to a greater extent than the iron, causing the bar to assume a curved form. Engaging within a tapped hole in the free end of the bar B is a projecting screw C; and the open end of A, through which the free end of the bar projects, is adapted to be screwed into a valve chamber D, disposed horizontally in the gas supply pipe, so that the projecting screw is adjacent to a ball valve arranged to co-operate with a seating in the valve chamber. Normally the ball rolls away from its seating into the larger part of the chamber; but on the water becoming heated to a prearranged temperature, the thermostatic bar curves and causes the screw to force the ball firmly on to its seating (the screw sliding over the surface of the ball while so doing), thus shutting off the gas supply. When the water cools, the ball-valve is automatically opened owing to the thermostatic bar again becoming straight.

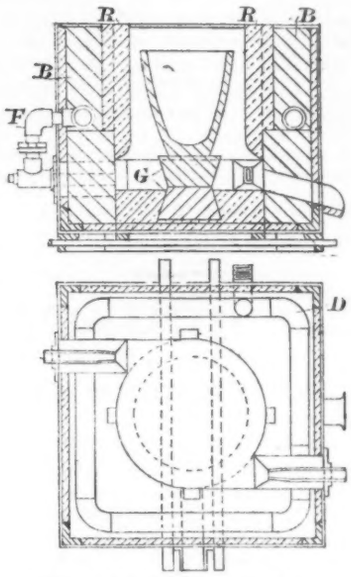
Gas-Fired Crucible Furnaces.—No. 103,232.

HALKETT, R., of Glasgow.

No. 5781; April 20, 1916.

The inventor's object is to construct a furnace so that the usual brick lining will become a permanent support—that is, will not be subjected to the destructive cutting action and high temperatures appertaining in furnaces of this kind, and thereby require renewal. The lining is protected by an inner lining of refractory material (by preference of a porous nature), which may be taken out and renewed without entirely rebuilding the furnace. The gas and air supply pipe is continuous right round the furnace, is mounted in the brickwork, and has outside connections to the burners—an arrangement which serves to pre-heat the gas and air mixture and ensures equal distribution at the burner nozzles.

Inside the casing shown, which may have a thin inner refractory lining and be provided with a removable bottom, is formed a brick lining B, which will be a permanency, owing to it being protected from the cutting action and high temperature by a further inner lining R of refractory material, by preference porous. A suitable material for forming the refractory lining may be made up as follows: 75 p.ct. of fire-clay or ball clay, 5 p.ct. of alumina, and 5 p.ct. of sawdust, or similar material mixed dry, to which is added a solution of 5 p.ct. of soda silicate



Halkett's Gas-Fired Crucible Furnace.

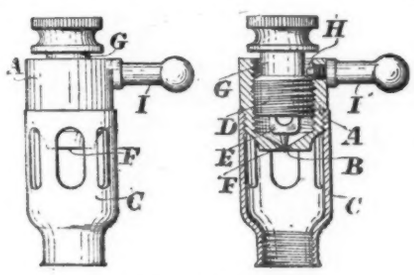
and 10 p.ct. of water—all treated in the usual manner. This lining extends towards the base of the furnace, rebates being formed in the brickwork to support fillets on the inner lining. The loose base piece carries a lining of similar material, in which are mounted blocks of graphite G to form a raised support for the crucible. In the lining B is a gas and air conduit D, which is continuous right round the furnace. Access to it is provided for a suitable supply of gas and air through the pipe P. A number of connections lead from the conduit D through the casing, and have outside connections F made to burners capable of being inserted in apertures formed towards the base of the apparatus. These burners have outer plugs whereby the burner nozzles may be cleaned as required. The function served by the circuit supply pipe D is that proportionate mixture of gas and air is pre-heated and will issue to each burner—the pipe acting as a reservoir under equal pressure throughout.

Regulators for Gas-Burners.—No. 103,013.

CARPENTER, T. R., of Moseley, Birmingham.

No. 1174; Jan. 25, 1916.

According to this invention, a stem, adapted to be screwed through a perforation in the wall of a cup-like part so as to engage within an annular recess in the inner tubular or annular part, is adapted to outwardly take the form of a radially projecting handle which is integral with the screwed stem, and by which the outer element of the regulator can be rotated in relation to the inner element.



Carpenter's Gas-Burner Regulator.

As shown, the regulator housing is a cylindrical cup member A closed at one end, but with a central perforation B in it. The housing is adapted to constitute the jet; and around its closed end the mixing chamber C is screwed—having the usual hit-and-miss arrangement for admitting air. Into the interior of A a tubular member D is adapted to be screwed. The interior of it is open at both ends—one end being bridged by an integral bridge E, while carrying an integral taper point or needle F adapted to project into, and regulate, the perforation B. Externally the internal member is provided with an annular recess G; while a peg or projection H is adapted to be screwed through a perforation in the wall of the casing and to project into the recess. By this arrangement, while the member A can be rotated for purposes of adjustment, it cannot be entirely detached. Outwardly the peg H takes the form of a projecting handle I, by which the housing may be rotated in relation to the inner member to effect the adjustment.

PARLIAMENTARY INTELLIGENCE.

THE 1917 SESSION.

The Seventh Session of the present Parliament was opened last Wednesday; and on the following day, the Chairman of Ways and Means reported that he had conferred with the Chairman of Committees of the House of Lords, for the purpose of determining in which House the respective Private Bills should be first considered; and they had decided that the Gas Bills contained in the following list should originate in the House of Lords:

Haslemere and District, Hemel Hempsted, Kenilworth, Lea Bridge District, and South Staffordshire Mond Gas (Power and Heating).

Thus the following will originate in the Commons:

Blackpool, Gas Light and Coke Company, and Sheffield.

LEGAL INTELLIGENCE.

WORKMEN'S CONTRACTS OF SERVICE.

Manchester Purification Employees Fined.

A prosecution under section 4 of the Conspiracy and Protection of Property Act, 1875, was heard at the Manchester City Police Court last Thursday, when the Manchester Gas Department, on the information of Mr. A. L. Holton, the Superintendent of the Bradford Road Gas-Works, summoned James Chappell, Joseph Statham, and John Mason for, on Jan. 22, wilfully and maliciously breaking a contract of service.

Mr. P. M. HEATH (the Deputy Town Clerk) said the defendants' duties were in connection with the purification of gas at the Bradford Road works; the contract of service being normally terminated by seven days' notice on either side, according to an agreement between the Gas Committee and the National Union of General Labourers. About 1.15 p.m. on the date mentioned, the purification foreman noticed that the three defendants had not returned to their work. He sent a messenger to the men; and they replied that they would not be back until 2.30. These facts were reported to the Works Superintendent, who then sent the same messenger to tell the men that Mr. J. R. Hill (the Manager of the station) and himself desired them to return to the works immediately; but they answered that they would not be long. Two of the men (Chappell and Statham) returned to the works at 2.30; but they were in such a state of intoxication that they were not allowed to resume work, and were sent home. Mason did not return to the works at all. As a consequence of the conduct of the defendants, the supply of clean gas was seriously interrupted. All three men were badged by the Ministry of Munitions. The purification of the gas was delayed several hours—until 5 p.m. next day, he believed—and great inconvenience was occasioned to consumers.

Mr. *A. L. Holton* bore out the opening statement, and added that Statham admitted he had done wrong, expressed regret, and resumed work the next day. Mason absented himself from the works for two full days, and Chappell for one day. They were suffering at the works from shortage of labour. As a result of the absence of these men the supply of clean gas was very seriously interfered with. The vital part of the work, on Jan. 22, was delayed about 3½ hours. The defendants knew that there was a shortage of labour, and that there were no other men available to put on their work.

Chappell, in his defence, raised the point that the three men left in the gang went on with the work of filling the purifying boxes. It was usual for men to "carry on" in this way in the absence of any of the gang. The work, therefore, was duly carried out. It was a by no means uncommon practice at Bradford Road for three or four purifying men to do the work of six. He and his mates had been working very hard lately; and they felt that they needed a rest. He denied that his absence was due to the effects of intoxication. He was ill, and could not resume work.

Statham said his defence was the same as Chappell's; while *Mason* replied that he had nothing to say.

The STIPENDIARY decided that each defendant must pay a fine of 20s.

SUPPLYING IMPURE GAS.

The Portsmouth Gas Company Prosecuted.

At the Portsmouth Police Court last Friday, the Portsea Island Gaslight and Coke Company were summoned at the instance of the Local Authority for a breach of the provisions of the Portsea Gas Order, 1882, for having on three dates—viz., Dec. 19, 20, and 21—supplied gas which was not wholly free from sulphuretted hydrogen.

Mr. J. H. HARRIS (instructed by Mr. G. Hammond Etherton, the Town Clerk of Portsmouth) appeared for the prosecution. Mr. A. M. PADDON (instructed by Messrs. Monier-Williams, Robinson, and Milroy, London) represented the defendants.

Mr. HARRIS having recited the Acts and Orders by which the proceedings were regulated, said that though only three separate occasions had been selected for prosecution, tests had been made extending over a long period of time; and the Town Council had received a large number of complaints as to the quality of the gas supplied by the Company for many months past. It would be proved that, on the dates named, when tested at the proper testing-places, and in the manner specified, the gas was found to contain sulphuretted hydrogen.

Mr. *A. A. Moncreaff*, the Gas Examiner to the Portsmouth Corporation, gave the result of various tests which he had taken during December and the latter days of November. On all occasions he found sulphuretted hydrogen in considerable quantities. For the week ended Dec. 20, he reported that sulphuretted hydrogen was present every day. His tests extended over a period of about a month; and on every occasion it was present in large quantities.

In cross-examination, witness said that in making the tests he generally used only one strip of lead paper. He was not aware that the regulations of the London Gas Referees required six strips of paper. He suggested that some of the gas was so impure that it could never have been through any purifier at all.

Dr. *Mearns Fraser*, the Medical Officer of Health, spoke of certain complaints that he had received, the origin of which he had traced to escaping gas from leaky pipes.

Mr. PADDON, for the defence, contended that he had two answers to the charge. The first was that any deficiency in the quality of the gas was due to the abnormal war conditions now prevailing, the greatly depleted supply of labour, delayed transport, &c., and to a main breakdown in certain valves at one of their works, for which they had been unable to arrange labour for its repair. These formed such circumstances as to justify and entitle them to relief under the various sections and orders controlling the gas supply as though they were a company within the London area; and if they could show that those conditions still existed, there could be no conviction. Further, he contended that the test, being taken with but one slip, was not a legal and proper test, since the regulations of the Metropolitan Gas Referees required six slips to be used.

Mr. HARRIS, in reply, urged that there was nothing in the Statutes to exempt the Company from their obligations as to the purity of their gas from sulphuretted hydrogen, whatever might be the case as to their obligations as to the illuminating power. As for the six strips being required, that was necessary by reason of the reports which the examining officer had to make to the various authorities interested. But this was not the case here; and since these various reports had not to be made, one or two strips were sufficient for every purpose required of them.

Mr. *W. J. Atkinson Butterfield* gave evidence on behalf of the defendants.

The BENCH, after a long hearing, found that the defendants had suffered no injustice from the way in which the tests had been taken, and that they had been taken in such a manner as to conform to the requirements of the law. They found, further, that nothing in the Statutes exempted the Company from these proceedings. But though they were bound to convict them, they recognized the difficulties under which the Company had been working, as disclosed in the evidence, and expressed their sense of this by imposing only the nominal penalty of £5 in each case, together with an order for £10 10s. costs in the first case.

A Gas Company's Mortgage Debenture.

Sitting in the Chancery Division, Mr. Justice Peterson on Friday sanctioned an extension of the time for registration by the Tickhill Gas Light and Coke Company of a mortgage debenture for £450, issued on June 18, 1915. It was stated that, owing to business men being called up for the war, the matter had been overlooked, and so the debenture had not been duly registered.

Morley Gas Department.—The accounts of the Morley Gas Department, just issued, show an income during the past year of £22,289, and an expenditure of £21,108; there being a surplus of £1181, as compared with a deficit of £1774 in 1915. Sales of gas realized £15,687.

Lostwithiel Gas Company.—It was reported at the annual meeting of the Lostwithiel Gas Company that the consumption of gas had been greatly reduced owing to the war measures affecting lighting. The cost of coal and other materials had again increased, making the business of the Company very difficult. Dividends were declared of 3s. 4d. on the "A" shares, and 8d. on the "B" shares.

Gas Price and Coal Freightage.—In a letter to the Town Clerk of Warrenpoint on the price of gas in that town, Mr. J. MacVeagh, M.P., stated that he and his colleagues had been giving attention to the question of freights on coal for Ireland, in the hope of being able to obtain from the Government the use of sufficient tonnage to enable the problem to be solved; but the matter was one of great difficulty and complexity; and he feared there was little chance of an early adjustment.

Willenhall Gas Company.—At the half-yearly meeting of the Company, the Directors' report and statement of accounts were approved, and dividends were declared on the various classes of shares (less income-tax) at the rate of 5½, 2½, 4¼, and 4 p.ct. respectively. The Chairman (Mr. C. Tildesley, J.P.) referred to the restricted lighting, but said he was pleased to report that there had been a slight increase in the sales of gas. Considering the high price of coal and the general increased cost of manufacture, the results of the half-year's working had been fairly satisfactory.

Manchester Lighting Deputation.—Reference was made at Wednesday's meting of the Manchester City Council to the deputation from the Corporation to various towns in the Midlands and East Midlands [*ante*, p. 222] in order to inspect the street lighting arrangements. The Lord Mayor (Alderman T. Smethurst, J.P.), who is the Chairman of the Special Lighting Committee, read a brief report of the tour, in which he said that the Special Committee were unanimously of the opinion that Manchester compared very favourably with the places seen. Mr. H. Ross Clyne (a member of the Gas Committee) declared that the report was a "bald one." There was, he said, no city in the country where the outskirts were so badly lighted as was the case in Manchester. Street accidents were constantly occurring. The report was adopted.

MISCELLANEOUS NEWS.

THE GAS LIGHT AND COKE COMPANY.

The Two-Hundred-and-Tenth Half-Yearly Ordinary General Meeting was held last Friday at the Chief Office, Horseferry Road, Westminster, S.W.—Mr. JOHN MILES, the Governor, in the chair.

The notice convening the meeting having been read by the SECRETARY (Mr. W. Beckford Long), the seal of the Company was affixed to the Register of Proprietors.

The report and accounts were taken as read.

THE GOVERNOR'S SPEECH.

The GOVERNOR: When we last met here, six months ago, I had the good fortune to be able to present a very satisfactory report on the Company's working; and we naturally all wish that cirumstances had tended to produce a similar state of affairs during the half year under review. But such is not the case. It is true that we are able to recommend the payment of the same dividend; but in order to do so, it is necessary to reduce the carry-forward by £129,000.

FIGURES FROM THE ACCOUNTS.

We are now beginning to feel the full effects of the war, and the troubles the Company have been experiencing during the past half year have been entirely beyond the Directors' control. To enable you to realize what the Company have had to fight against, I will give you shortly a few of the principal figures in the accounts. Coal and freights cost £289,000 more last half year than in the corresponding period of 1915. Oil, including freights, cost £43,000, and repair and maintenance of works and plant £57,000 more than last year. The item of repair and maintenance of mains and service pipes has also increased by about £12,000. The increases under the two latter heads are entirely due to the increased costs of material and wages, which, as a matter of fact, have affected practically everything on the expenditure side of the balance-sheet. Taking all the increases in working expenses together, they amount to the large figure of £435,000; and remember this is for six months only.

To set against this enormous advance in working expenses, the Company have fortunately obtained increased receipts under several headings—the brightest spot in the accounts being found in the receipts for residual products. Coke brought an increased revenue of £127,000; tar and its products, £95,000; and ammoniacal liquor and sulphate of ammonia, £19,000—making a total of £241,000. It is also satisfactory to note that, owing to the increased sales of gas, there has been an addition to the revenue during the half year of £16,000. This figure would have been still higher had it not been for the fact that we were forced, under our statutory obligations, to reduce our price for public lighting and for gas sold on the south of the Thames by 2d. per 1000 c.ft., which reduction amounted to a sum of, roughly speaking, £10,000. There has further been a satisfactory increase in the receipts for meter, stove, and fittings' rentals, amounting to £8000. This, taken in conjunction with the unusually brisk demand for gas appliances of all descriptions, and the increase of 5600 in the number of consumers, is a good augury for the future of the Company.

You will notice in the capital account that, although we have spent £235,000, yet the net increase in expenditure for the half year has been only £117,000, owing to the fact that the Directors considered it desirable to write-off out of revenue a sum of £53 000 in addition to the depreciation usually written-off meters and stoves—£65,000. Having, therefore, set aside such a large sum for depreciation, the Directors felt they might well leave the question of further writing-down the Company's investments this half year until a future occasion, if necessary, as these investments have already been largely depreciated.

To sum up the financial results of the half year. After providing for fixed charges, and setting aside £5000 towards the redemption fund, there remains a profit balance of £213 578. The amount brought forward from the previous half year being £480,512, there is a total available balance of £694,090, out of which the Directors recommend the payment of a dividend on the ordinary stock at the rate of £4 4s. p.ct. per annum, which will absorb £342.582, and leave £351,508 to be carried forward to the credit of the current half year.

With regard to salaries and wages. Having carefully considered the very material increase in the cost of living, the Directors have, during the half year, increased the war bonus they were paying to all male weekly employees over the age of eighteen years to 10s. per week. They have also made allowances to the female staff, and to the less highly paid staff officers. The Directors are pleased to say that the staff and workmen have thoroughly appreciated the additions to their pay, and many testimonies of appreciation and expressions of loyalty have been received. The total cost of these bonuses is now at the rate of £275,000 per annum, which is equivalent to 2d. per 1000 c.ft. in the price of gas. This is, of course, a very serious matter for the Company; but in all the circumstances the Directors felt that they were doing what was right in giving the increased bonuses.

WAR-TIME WORK AND EXPERIENCES.

As stated in the report, the number of men now on active service is upwards of 3700. We miss these men extremely; and we deplore the many casualties which have occurred in their ranks. But we are glad to think they are now doing their duty to the country, as they did in the past to the Company. We are looking forward to the time when they will return to the Company's service; and we sincerely hope that this day is now not very far ahead. I should like here to bear testimony to the work that has been done by those who have remained behind, and by the new comers—especially the women workers, whom the Company are now employing not only in the offices, but also in almost every department of the works. The following are some of the occupations in which women are making themselves useful, in addition to the usual clerical and ordinary office work: Timekeeping, attending to weighbridges, working on purification plant, dealing with coke and clinkers, cleaning bricks, stove repairs and cleaning, motor driving, mantle manufacture and mantle maintenance, painting meters, and packing stores. The number of women employed by the Company is now upwards of 1100; and, in consequence of our men still having to join the Forces, it is fully intended to extend their activities into other branches of our work.

Had it not been for the loyalty of the old and new staff, the Company would indeed have been powerless to cope with the difficulties with which they have been faced. Since the beginning of December last, owing to the cold weather, we have had to contend with an enormous demand for gas—amounting, for instance, in the month of January to no less than an increase of 19 p.ct. over the corresponding period of last year. This has strained all our powers to the utmost; but the officers of the Company and the workmen generally have worked splendidly throughout these difficult times, and the Directors avail themselves of this opportunity of publicly expressing their appreciation of the work that has been done. The Directors are also pleased to acknowledge that the consumers have fully realized that, in spite of the enormous difficulty in obtaining the necessary appliances, material, and labour, the Company are doing all in their power to render efficient service.

As you are all probably aware, the Company are doing an immense amount of work for the Government in the way of producing materials for the manufacture of all kinds of munitions of war; and I am glad to say that the consumers, as was only to be expected of them, have, as a body, willingly accepted in the most reasonable spirit any inconvenience which has arisen from the abnormal war conditions affecting the Company's supplies of gas.

STAFF CHANGES.

The Directors much regret to report that Mr. Rayner—who was absent at our last general meeting, owing to ill-health—has been advised by his physicians not to return to office. Mr. Rayner worked for the Company for forty-two years, during the last thirteen of which he acted in the capacity of Secretary, and threw into his work the whole of his energy. The Company have never possessed a more loyal officer. He was respected and liked by the Directors, the officers, and the staff generally; and he will be greatly missed by them all. It is the earnest wish of the Directors and of all his former colleagues that, with rest from work, his health may be fully restored and that he may thoroughly enjoy his well-earned leisure. The Directors have appointed Mr. Beckford Long as Secretary, in place of Mr. Rayner. Mr. Long acted as Mr. Rayner's assistant for many years; and the Directors feel confident that they have obtained the services of a capable and hard-working officer to fill this important position. The Directors have also lost the valuable services of Mr. Thomas Milne, who has retired from the position of Salesman of the Company's chemical products. Mr. Milne served the Company for forty-four years, during which time he proved himself an energetic and reliable officer. We all sincerely hope that he may be long spared to enjoy his well earned pension.

A STATUE OF SIR CORBET WOODALL AT BECKTON.

There is another personal matter to which I wish to refer. As you are all aware, the Company owe a great debt of gratitude to the late Governor, Sir Corbet Woodall, for the splendid work he did for them; and the Directors feel that it would be only right that his memory should be preserved in some suitable form. They think that it would be a good thing for the staff of the Company to be reminded of their late distinguished Governor; and the Directors would therefore be glad if the shareholders would agree to vote a sum of money to be expended in the erection of a statue to his memory. [Hear, hear.] The Directors suggest, if the shareholders approve (as they doubtless will), that the statue should be erected at the Beckton Gas-Works, which is the Company's largest works, and in which the late Governor took so much interest. The Directors propose that the work should be entrusted to Mr. A. G. Walker, the sculptor who designed the excellent statue of Florence Nightingale at the foot of Regent Street.

THE RECENT EAST-END EXPLOSION.

You will be glad to hear that the Company's works were only slightly affected by the recent serious explosion in the East-End of London. A large number of services have been temporarily put out of use, and this will mean a loss of revenue in the district for some time to come. Our staff promptly visited the scene of the explosion, and recovered some £700 in coppers from the automatic meters situated there.

FUTURE OF THE COMPANY—AN INCREASE IN PRICE.

With regard to the future, it is very difficult to prophesy. But it is certain that at the present time difficulties tend rather to increase than to diminish; and it will certainly be necessary in the near future to raise the price of gas. I fear there are some who think that, owing to increased sales of gas and the augmented receipts for residuals, the Company will not require to raise their price. Unfortunately, however, the Company have now to face still higher prices for oil, as up to the present we have had the benefit of drawing upon old stocks at lower prices. This fresh increase will amount to at least a further 100 per cent. This will, with other advances, seriously affect results in the coming twelve months. No definite decision as to the amount of the increase has yet been arrived at; but the public and the shareholders may rely upon the Directors not raising the price to a greater extent than is absolutely requisite to provide for the necessary contingencies. It is quite obvious to anyone who has carefully studied the accounts that it would be impossible for the Company to continue to supply gas at an increased price of only 20 per cent. when the prices of raw materials have increased so far in advance of this. To give you some idea of how enormous the increase in costs has been since the beginning of the war, I may mention that coal has advanced in price 50 p.ct., coal freights 400 p.ct., and oil (including freights) 300 p.ct. No one will regret an advance in price more than the Directors; but they hope that the shareholders and the public will realize that the matter is one quite outside their control. The Directors feel some satisfaction in the fact that they have been able to keep the price down to 3s. per 1000 c.ft. for nearly two years; but with a deficit of £129,000 in a half year, and with the cost of oil and other items still continuing to rise, it is quite impossible for gas to remain at this price.

It is very disappointing to the Directors that they have not a better tale to unfold, but, on the other hand, there is nothing of which to be

ashamed. The Company are in a sound position; but circumstances over which the Directors have absolutely no control are for the present seriously handicapping our working. The Company's prospects after the war are excellent. Gas appliances are being installed in all directions, and gas is being used more and more every day for industrial purposes. The shareholders can look forward, therefore, with good assurance to the future prosperity of the Company after the war-cloud has cleared away.

ADOPTION OF THE REPORT AND ACCOUNTS.

I have pleasure in moving:

"That this meeting do agree with and confirm the report of the Directors and the Auditors' report and statement of the accounts of the Company as transmitted to the proprietors on the 26th ult."

But before putting the resolution to the meeting, I shall be happy to hear any remarks which proprietors may wish to make, and will endeavour to answer any questions they may ask.

The DEPUTY GOVERNOR (Mr. H. J. Waterlow) said he had much pleasure in seconding the resolution.

The GOVERNOR: If no one has any remarks to make, I will put the motion.

The resolution was put, and carried unanimously.

THE DIVIDEND.

The GOVERNOR: I will now ask the Secretary to read the minute recommending dividends for the past half year.

The SECRETARY read from the Directors' minutes the following:

Resolved: That it be recommended to the half-yearly ordinary general meeting of proprietors, to be held on the 9th prox.:

(1) That the sum of £5000 be set aside out of the divisible profits of the Company for the half year ending on the 31st day of December last towards the redemption fund, in accordance with the provisions of the Company's Act of 1903.

(2) That a dividend as follows for such half year be declared—viz.:

On the 4 p.ct. consolidated preference stock, at the rate of £4 p.ct. per annum;

On the 3½ p.ct. maximum stock, at the rate of £3 10s. p.ct. per annum;

On the ordinary stock, at the rate of £4 4s. p.ct. per annum:

subject to deduction of income-tax.

The GOVERNOR: I beg leave to move the adoption of those recommendations.

The DEPUTY-GOVERNOR seconded the motion, which was put and carried.

RE-ELECTION OF DIRECTORS AND AUDITORS.

The GOVERNOR: There are three Directors—the Right Hon. Sir Daniel Goddard, Mr. J. Lister Godlee, and myself—who retire by rotation at this meeting. I will therefore now vacate the chair in favour of the Deputy-Governor.

The DEPUTY-GOVERNOR: Probably at no time in the history of this Company has a Governor come forward for re-election by the shareholders at a more anxious period, and our friend, Mr. John Miles, whom I propose to you for re-election, comes forward now for your sanction at a time of life when most of us I think would prefer to have retired to our ease. Mr. Miles has shown very great interest and activity in the affairs of the Company; and I feel very strongly that it is for your benefit, as well as it is for the benefit of the Board, that you should accept him again as Governor of the Company. I have very much pleasure in proposing that he be re-elected a Director of the Company.

Mr. DOUGLAS WALKER: I have served long enough as a colleague of the Governor to appreciate the qualities which make him such an admirable Chairman; and I am delighted to find I am called upon to second his re-election.

The motion was put, and carried unanimously.

The GOVERNOR (having resumed the chair) said: I beg to thank you very sincerely for my re-election, and I can assure you I shall do the best I can for the Company. I now have to move the re-election of Sir Daniel Goddard. He has not been a Director very long; but I am quite sure the experience he has had in other companies will make him a most admirable Director, and a great help to us in every way. I have great pleasure in moving his re-election.

The DEPUTY-GOVERNOR said he had much pleasure in seconding the motion. They had found Sir Daniel Goddard's assistance on the Board a great tower of strength. His experience was of many years' standing; and more particularly as an expert his aid was invaluable.

The motion was carried unanimously.

Sir DANIEL GODDARD expressed thanks for his re-election.

The GOVERNOR: There is still one other Director to be re-elected. You all know Mr. Godlee, as he has been before you for years. I have much pleasure in moving his re-election.

The DEPUTY-GOVERNOR seconded the motion.

The resolution was carried unanimously.

Mr. GODLEE briefly returned thanks for his re-election.

The retiring Auditors, Mr. J. A. Stoneham and Mr. P. H. Ashworth, were duly proposed and seconded for re-election.

Mr. A. H. POWELL observed that the amount of the remuneration should be mentioned in the resolution.

The GOVERNOR said they were following the lines of previous elections; and, as the appointment was regulated by Act of Parliament, there was no necessity to mention the amount of remuneration.

Mr. POWELL insisted that the motion would be illegal if the amount were not mentioned.

The GOVERNOR: Then we have been acting illegally for many years.

Mr. POWELL said anyone acquainted with the routine of public meetings knew full well that the amount of remuneration must be stated.

The MANAGING DIRECTOR pointed out that the matter was governed by section 42 of the Company's Act of 1911, which provided that the amount was fixed by the Directors.

The SOLICITOR said the matter was entirely governed by a Special Act of Parliament. It was only when companies were registered under the Companies' Acts that the rule applied of the shareholders fixing the remuneration of the auditors. It was not necessary to have any special mention of remuneration in the present case

The motion was put and carried.

THE LATE SIR CORBET WOODALL.

The GOVERNOR: I will now put to the meeting the motion with regard to the memorial to the late Governor. I beg to move: "That the proposal to erect at the Beckton Gas-Works a statue of the late Governor, Sir Corbet Woodall deceased, be approved, and that steps be forthwith taken accordingly." Will some proprietor please second this?

Mr. JOSHUA HANDS asked how much the statue would cost.

The GOVERNOR said roughly about £1000.

Mr. HANDS said he should be pleased to second the motion, as he thought the late Governor was quite worthy of a memorial.

The motion was carried unanimously.

The GOVERNOR: I thank you, for I think it is quite the right thing to do. Sir Corbet Woodall was not an ordinary Director, he was an extraordinary one; and I am sure his memory ought to be perpetuated by some such memorial as this. I rather think a statue at Beckton is as good a subject as you could choose. I thank you all for agreeing with our proposal.

This concluded the proceedings at the ordinary meeting.

Extraordinary Meeting.

The SECRETARY read the notice convening the meeting.

The GOVERNOR: I now declare this meeting to be an extraordinary meeting for the purpose mentioned in the notice. Before I address you on the subject of the Bill, the Secretary will read the heads.

The SECRETARY read the heads, as follows:

CLAUSE 1 gives the short title.

CLAUSE 2 contains the interpretation of expressions used in the Bill.

CLAUSE 3 authorizes the Company to provide, purchase, maintain, and use ships, lighters, and vessels for the purpose of their undertaking, and apply the moneys of the Company therefor. It also repeals clauses in the Company's Act of 1873 regarding the purchase of ships which become inoperative.

CLAUSE 4 provides for holding the ordinary general meetings of the Company annually, after the December half year, instead of half yearly, and authorizes the Directors to declare a dividend for the June half year.

CLAUSE 5 provides that the existing statutory provisions regarding standard price and sliding-scale shall apply to dividends declared for a June half year by the Directors under the powers of clause 4 of the Bill.

CLAUSE 6 repeals the section in the Company's Act of 1903 which limits the use of the reserve fund, and authorizes the application of the fund to purposes to which it was applicable from its formation until 1903.

CLAUSE 7 adopts the Model Clause relating to the appointment by the Directors of a Managing-Director from their body.

CLAUSE 8 provides that a nomination by a co-partner stockholder of the Company shall not be revoked or avoided by subsequent marriage; authorizes the nominee of a deceased co-partner stockholder to execute transfers of stock if 16 years of age or upwards; and authorizes a co-partner stockholder to nominate a person to receive money deposited by him in addition to bonus money and stock.

CLAUSE 9 authorizes the Company to register a transfer of stock in the name of co-partner shareholders in certain circumstances where the transferee is unable to execute it himself.

CLAUSE 10 provides for the cost of the Act being paid for out of the Company's revenue.

The GOVERNOR: You will have learned from the heads of the Bill, which have just been read, that the two principal objects are to obtain powers to expend more money on the purchase of ships, and to hold the ordinary general meetings of the Company yearly instead of half yearly. With regard to obtaining powers to expend more money on the purchase of ships, under the Company's Act of 1873 we are hampered by a provision which requires that the capital expended must be limited to £150,000. While this provision might have answered our purposes very well in 1873, when the Company's business was only one-seventh of what it is now, the sum authorized is altogether inadequate under present conditions. Since the war the Company have purchased a considerable number of steamers, which have been most useful during a time when outside tonnage has run up to anything between 12s. and 16s. per ton. Our ships, even although most of them are old-fashioned, are not, on an average, costing more than 6s. 6d. per ton to run, including interest and depreciation on capital. It is obvious, therefore, that if the Company had not had these ships of their own, but had been under the necessity of chartering outside tonnage, there would have been a large increase in revenue expenditure during the half year. The Directors therefore think that the first object of the Bill is one of which the shareholders will thoroughly approve. The second object is to obtain powers to hold the ordinary general meetings of the Company yearly instead of half yearly. Some shareholders would no doubt prefer the half-yearly meetings; but after careful consideration, the Directors have come to the conclusion that it is most desirable to make this alteration. It will not only relieve the Company of a considerable amount of expense and labour, but it is also thought that a year is a much better period than a half year for reviewing the Company's position. Half-yearly balance-sheets are very apt to give a wrong impression of the Company's progress and position; and the year that has just passed is a good example of this. The report on the June half-year's working was very good, but that on the December half year the reverse of this; so that the tale told for the June half year was, taken by itself, unduly promising. Taking the two half years together, however, the year's working shows the Company's progress much more accurately. Most of the large railway companies now hold their general meetings yearly; and I believe many Banks have also adopted this course. The Directors hope, therefore, that in following these precedents they will be acting in the best interests of the shareholders in thus modernizing the practice of the Company.

The dividends in respect of June half years will not be affected by this change, as they will be based in the usual way on the price of gas charged during the half year. It is also proposed to remove the restriction that applies to the reserve fund. This fund was built up by the shareholders foregoing a certain part of their dividends in the past. It is felt that no good purpose is served by the prohibition that now exists with regard to the fund, and that it should be available for making-up dividends, even although they are above the rate of 4 p.ct. The fund as it stands is practically unavailable in ordinary circumstances; and the Directors feel that it is a step in the right direction to make it once more a real reserve fund. The other matters in the Bill are of a purely domestic character, and require no explanation unless you desire it. The proposals are of such a non-contentious character that it is hoped that there will be no opposition. I beg leave to move: "That the Bill now submitted—intituled 'A Bill to confer further powers upon the Gas Light and Coke Company'—be and the same is hereby approved, subject to such alterations as may be made in the Bill by Parliament and approved of by the Directors."

The DEPUTY-GOVERNOR seconded the motion, which was put and carried.

The GOVERNOR: That concludes our business.

VOTES OF THANKS.

Mr. W. A. HOUNSOM, in proposing a hearty vote of thanks to the Directors, said he did so under exceptional circumstances. The anxieties, difficulties, and dangers which at the present time confronted those who had to deal with public companies could only be realized by those in the swim; and it was with this difficulty strongly in his mind that he emphasized the vote of thanks.

Mr. R. J. NEVILLE NEVILLE, M.P., seconding the motion, said the Directors had shown great foresight in managing affairs, as was indicated by the reduction in freight from 15s. to 6s. 6d. He thought that other companies which had gone through this trouble would envy the Gas Light and Coke Company. He had the greatest pleasure in seconding the motion.

The resolution was passed unanimously.

The GOVERNOR: I thank you very much for the kind way in which you have referred to our services, and I can assure you we shall continue to give the best of our services in the interests of the Company.

THANKS TO THE STAFF.

Mr. E. P. VÂCHER was quite sure all would agree that the Company had a very loyal staff. He therefore proposed that the thanks of the shareholders be tendered to the whole of the staff from the very highest to the lowest. He said the "lowest" advisedly, because they must not forget that they would not have been able to make gas but for the brave fellows who brought the coal from the north and risked their lives on behalf of the Company.

Mr. A. H. POWELL seconded the motion, which was put and carried unanimously.

Mr. GOULDEN, in expressing thanks on behalf of the staff and workmen of the Company for the vote of thanks, said he wished particularly to thank the proposer for the kind terms he used in making the motion. Every member of the staff from top to bottom was doing his very best to fight against the adverse circumstances in which the Company found themselves, and they would continue to do so. That they had done well could be judged by the fact that, in the absence of nearly 4000 workmen, they had been called upon to deal with a greater amount of gas this last half year, which necessitated the handling of 60,000 extra tons of coal. The Company could thoroughly rely on the loyalty of their workers, and they were doing their best to combat the adverse circumstances against which the Company at the present moment were fighting.

The proceedings then terminated.

A Suggestion for Improved Street Lighting.

Referring to Lord Sydenham's recent plea for the better lighting of the Metropolis, "Municipal Engineering and Sanitary Record," acquiescing in the view that the restrictions hitherto imposed have been too stringent, puts forward the following suggestions for remedying the present state of affairs: (1) Alternate street-lamps should be screened but lighted in weather such as would permit of an air raid, and, after (say) 7 o'clock at night; (2) arc lights and high-pressure gas-lamps should be substituted by low-power units; (3) all lamps should be fitted with a metal dish suspended underneath the light, the dish being enamelled white inside. A cone-shaped dispersing reflector to be fitted over the unit to reflect the light downward, and at the same time prevent the light being seen from above; (4) the lamps, other than those to be used as above, to be left in their usual condition; (5) up to 7 o'clock at night (or for a certain period after sunset), when the traffic is heavy, all the lamps could be lighted. At a predetermined time, the unscreened lamps to be extinguished in any weather which would permit of an air-raid, leaving only the diminished and dispersed light from the lamps under (1). In foggy or otherwise inclement weather, all lamps to be lighted.

Lincoln Gas Supply.—Complaint was made at a meeting of the Lincoln City Council last Tuesday of inadequate gas pressure; Mr. Bunning stating that the pressure was at present so poor it was impossible to use stoves. Alderman Footnen agreed that the gas as at present supplied for purposes of heating and lighting was very bad; but Mr. P. Milner declared there was no complaint in his part of the City.

Launceston Gas Company.—The annual meeting of the Launceston Gas Company was held on Monday of last week. The report recorded the gratifying fact that the charge for gas had not been increased, notwithstanding the continued high price of commodities. Further, a concession had been made to consumers of gas for power purposes, as from Jan. 1. During last year a new sulphate plant had been erected. The make of gas had decreased by 13·13 p.ct., but the sale had fallen off by only 12·07 p.ct. A dividend of 6s. 9d. per share was declared.

BRENTFORD GAS COMPANY.

The Yearly Ordinary General Meeting of the Company was held last Friday, at Caxton Hall, Caxton Street, Westminster, S.W.—Mr. R. J. NEVILLE NEVILLE, M.P., in the chair.

The SECRETARY (Mr. John T. Croxford) read the notice convening the meeting; and the report and accounts were taken as read.

A DIFFICULT AND ANXIOUS YEAR.

The CHAIRMAN, in moving the adoption of the report and accounts, said the first thing he should like to say to the proprietors was that it was common knowledge to everybody—not only to those engaged in the gas industry, but to those engaged in any business, even in a private and domestic capacity—that the year just passed through had been one of incalculable difficulty and great anxiety. They, like other traders, had had to face entirely novel conditions; and he thought (he was speaking perfectly generally) that he might congratulate the proprietors upon the way the good ship had been able to weather the storm.

PRICE OF GAS AND RAW MATERIALS AND TRANSPORT.

It would be remembered that the Company had the proud distinction for the first eighteen months of the war of being the only gas concern—at any rate in the neighbourhood of London—that did not raise the price of gas. But this time last year they were forced, owing to the difficulties of transport and the cost of raw materials, to increase it; and they did this by the modest sum of 2d. per 1000 c.ft. It would be remembered that in the autumn of 1914, their great neighbour and friend south of the water increased the price by 8d.; and the greater Company—the Gas Light and Coke—were compelled to raise their price 6d. But the Brentford Company were, as he had said, able to get through the first eighteen months of the war without doing so. This, as he explained at the time, was largely due to the foresight of their Engineer (Mr. A. A. Johnston). They were fortunate that the war found them with the largest stock of coal they had ever had on their premises, and the most favourable contracts running that anyone could have wished for at the time. Now, after about two-and-a-half years of war, naturally the Company were beginning to face the same situation as their neighbours had to at the very commencement of the war; so that the proprietors might be congratulated upon the fact that, in their case at all events, a large increase had been delayed. This meant a great deal more money in the pockets of the proprietors and of the consumers. It might also be recollected that they were in the proud position in this district of theirs (which now extended to upwards of 90 square miles, and ran nearly to Windsor) of having practically 90 p.ct. of the actual inhabitants taking gas. This was a matter of the greatest possible advantage to the Company, and showed the stability of the foundation upon which it was built. He did not know whether any other company was so fortunate in this respect. But they intended, so far as they could, to make use of this advantage; and if they could get capital (which they could not do at present), they would still be able to extend their business right and left.

CAPITAL EXPENDITURE AND RE-ORGANIZATION AT BRENTFORD.

The accounts were interesting. The first one to which he would draw attention was that referring to capital. The second item was "Land acquired, £13,125." This was land they had purchased as near as they could to their works at Brentford. The site at Brentford was most cramped, so far as the actual manufacturing operations were concerned. Under their Act of Parliament, they were only allowed to manufacture on scheluled lands. It might be remembered that the actual piece of land upon which they were authorized to manufacture was shaped something like a banana. They had the Brentford High Street on the one side, and the River Thames on the other; so that they were, in effect, "between the devil and the deep sea." It was therefore impossible for them to extend the works there. Had the powers sought in their last Act of Parliament been granted, so that they could have put up some cupolas and lovely buildings at Chiswick, to which the æsthetic people of Chiswick objected [Laughter], they would not now have been so cramped for space. It was therefore their duty to find land for the Company, and to make it available for their particular work. They had therefore bought a site which was at the actual fork of the River Thames and the Grand Junction Canal, which canal was also one of their feeders at Southall. This land had been bought for the storage of coal and materials generally. They could not store materials at Brentford, and they had to get rid of them from there as best they could. This had been a great drawback both with regard to the selling of coke and the storage of coal. Their practice up to now had been not to store coal at Brentford, because they could barge the coal up the river. But now they could not live from hand to mouth, which had been the cheapest way for the Brentford works—that was to say, to discharge the coal direct into the retorts from the boats without further handling. This could not be done now—partly because of the difficulty of getting raw material, and partly owing to the submarine menace. It was under these circumstances that the Directors had bought this piece of land for the purpose of storing coal. The barges that took coal up to Southall could bring back coke to store on this piece of land; and by this means they would be able to support their coke trade in Brentford, which local trade was the most lucrative part, because they could distribute the coke themselves without the intervention of a factor, and so make a bigger profit. Then they had bought another piece of land adjacent but not contiguous (because there were a number of little roads and lanes intersecting the property) on the north side of the High Street. This land had been used as stabling for Messrs. Carter, Paterson & Co.; and to this new acquisition they proposed to transfer their stove and other work, which was carried on on the Brentford site, and so render more space available for the extension of plant for the manufacture of gas. Then they had bought some other little slips of land right at the far end, at the V tip, as it were, of the fork of the first piece of land on the north side of the road. This would extend a little further the bit of land adjoining their stores department; and this would become available a little later on for further extensions.

The next item in the capital account was new buildings, and machinery, £11,994." Anybody who travelled on the Great Western line, and knew the Company's Southall station (which adjoined it, and had sidings on to the main line), would have seen that there had been a good deal of activity there lately, and that a large erection of buildings and extension of plant had taken place, from which, however, they were not deriving any benefit to-day, but would do so in the future. They hoped to see a great access of revenue from this; and they were bound to make provision for the future. Only the previous day, the output of gas was the largest they had ever had in a single day in the history of the Company. It was between 4 and 5 million c.ft. more than the corresponding day last year. The proprietors would understand that they had to make provision for the coming prosperity which they hoped they foresaw. One of the difficulties of gas companies was that they were always increasing. It was one of their benefits, and at the same time one of their difficulties, that they were ever enlarging the consumption of gas. Therefore, they had to look ahead. If they did not do this, when they had a great fog or frost, they might find they could not supply the gas; so they had to look ahead and have a margin of at least two or three years. It would be seen that the total capital spent during the year was £46,949, while there had been written off for depreciation £34,142; so that the net amount by which the capital was increased was £12,806, which was £319 less than the actual cost of the land they had bought. This showed there had been considerable economy with regard to the capital account. He might point out that one of the criteria of the prosperity of a gas company was the total capital spent per 1000 c.ft. of gas sold. This time last year in their case it was 7s. 4d.; to-day it was 7s. 1d. Were it not for this low capital expenditure per 1000 c.ft., the Company would not be in anything like the same position as it was in to-day. In 1898, they sold 2719 c.ft. from every £1 of capital employed, while last year they sold 2800 c.ft., which made a difference of 3 p.ct. The proprietors would see from this of what value it was to the Company to be able to reduce their capital per 1000 c.ft. It was of the greatest possible advantage to the proprietors and to the consumers.

THE REVENUE ACCOUNT—MANUFACTURING MATERIALS AND TRANSPORT.

The crucial account was the revenue. He did not think it necessary to go through all the differences. Coal and oil cost £362,030—an increase of £83,109, or 23 p.ct. This was a much less increase than many companies had had to meet; and it was due to the favourable condition in which their contracts were. But had the same quantity of coal been bought at pre-war prices, it would have cost £244,305, or about £117,000 less—that was, a difference of 48 p.ct. In 1914, and well on into 1915, they had the favourable contracts. Now they had to face a different state of affairs, and it was because of this that they had now to raise the price of gas another 4d. Transport had been one of the greatest difficulties they had had all along; and recently it had been more accentuated than ever. For a long time, they were able to get their coal up the river; but owing to the commandeering of tonnage by the Admiralty and for other purposes, as well as to a slight extent the submarine menace, they could not now get the river-borne coal as they previously did. They had therefore to look to other arrangements. Luckily, they had two strings to their bow. They had the railway sidings at Southall and the railway sidings behind them at Brentford; and they hoped also to make arrangements to bring coal to Brentford Dock, which was on the Grand Junction Canal, quite close to the new site he had mentioned. There was little chance of improvement in regard to transport at the present time; and therefore they had to be extremely careful. But they were glad to have been able to make provision by railway carriage. The proprietors would see the importance of transport when he mentioned that no less than £61,500 of the increased cost of raw materials was due to transport charges. This meant 4d. per 1000 c.ft.; 1d. per 1000 c.ft. on their consumption being about £15,000 or £16,000 a year. Therefore the £61,500 accounted for 4d. of the 6d. per 1000 c.ft. by which they had now increased the price of gas during the war. Looking at the other revenue charges, there were decreases, except in regard to wages. This was a difficult matter at the present time; but some of the increase was due to the additional 3·1 p.ct. in the gas sold. They had also lost a great many of their skilled workmen; and the substitutes they had—all good and loyal—were not equal to the skilled men who understood the work. Another item that called for attention was one that was in favour of the year. The wear and tear on manufacturing plant was down £3656. This was not, he thought, a matter on which they could congratulate themselves. They simply could not get the materials and labour necessary for a great many of the repairs that they would otherwise have carried out in 1916. The figure would therefore probably rise in future. Up to the present, as the proprietors were aware, the Directors had dealt liberally with wear and tear; but now they simply could not get the work done. The same applied to wear and tear on distribution. This was about £1400 less; and they would also have to spend more money in this direction when they could get the work carried out. Public lamps showed a decrease of £782. This was due to less lighting under the Defence of the Realm Act. But he thought the proprietors would congratulate themselves upon the fact that, despite the Defence of the Realm Act, they had been able to secure an increase of 3·1 p.ct. in consumption over the whole year, which indicated how much larger would have been the increase in ordinary circumstances. In view of this, they were able to face the difficulties and the restrictions with perfect confidence, though he did not think they would get much benefit out of the new order as to more extended public lighting, because they were not entirely in the London district. Another item was active service allowances, which were less by £1158; but a very large item against the year was war bonus, which was greater by £10,198. Well, every company—public and private—had had to face the increase in the cost of living; and the proprietors could well understand it was absolutely essential that in regard to the workmen they should do what other people did. They had to make them contented in these times. No company had been served more loyally than, and with such splendid zeal as, they had been. Not only had there been the difficulties to which he had referred, but there had been more work per head to be done, owing to the depletion of the staff and other causes; but he might say, with the greatest possible confidence, they had been excellently served by the men on the works. The men appreciated the war bonus; and he hoped they would continue to serve the Company in the same spirit as in the past.

THE ROLL OF HONOUR, AND THE WORKERS AT HOME.

The roll of honour was one of the splendid features in the current history of the Company. Some 604 men had joined the Colours. A great many of the remaining staff were over age and militarily unfit. Out of the total staff of 1615 men, 37 p.ct. were serving the country. He was sorry to say 38 of the men had made the supreme sacrifice, and had passed through the great adventure. A great number of them, too, had been wounded. This was a matter the Board also greatly regretted; and, so far as they could, they intended to help the men through their trouble. Their forces had been reduced to 1374, including 190 women. So that they had gone down in number nearly 250. The 190 women the Company were employing were doing very well, and, with a little practice, would do better still. As to the men, he did not think that there were many more to be "combed out," seeing that most of those of military fitness had gone. In their business, they were bound to have effective men. If not, they could not carry-on. But he did not think they would suffer much more depletion of able men. Despite the depletion already suffered, and all the other difficulties, the actual increase in the gas sent out during last year, compared with the year before the war, was 11 p.ct., which showed that all their employees had worked well. The next item was very favourable. Bad debts were the criterion of the prosperity of a district. They had decreased by £633, which showed there was plenty of money going about among their customers, and so they were paying up better than before the war. With shortage of coal and cold weather, there was not the slightest doubt, if the war went on much longer, that there would be more new applications for gas for heating and cooking than they really cared for, because the difficulty was to get raw material and labour and plant for carbonizing it. The total gross expenditure was £618,022, as against £532,044 the previous year. That was to say, there was a difference between them of £85,978, or a 16 p.ct. increase. As he had said, coal and oil cost about £83,000 more; so that the difference in the expenditure was almost accounted for by this item alone. In addition, there was the war bonus of £10,000.

THE INCOME.

On the credit side of the account, the sale of gas and meter-rentals amounted to £577,293, against £532,779 in 1915. This was an increase of £44 514, or equivalent to 8·39 p.ct. This was partly due to the increased sale of gas, and partly to the 2d. put on the price last year. There was another matter which they had gone into carefully—that was the unaccounted-for gas, which was larger this time than usual. They did not like more unaccounted-for gas than they could help. As a result of their investigation, they found that the unaccounted-for gas was partly temporary; and there were excellent reasons for it. Though it was equal to 7·1 p.ct. (they preferred it should not be above 6 p.ct., and would rather have it down to 5 p.ct.), they had the satisfaction, such as it was, that the premier company in London had unaccounted-for gas equal to 7·56 p.ct., which was 0·46 p.ct. greater than their own. If they could reduce it, they would; but he rather thought they would not do so this year. When the price of gas was raised, they always got a larger unaccounted-for balance, seeing that they could not change all the prepayment meters at the same moment. With 64,000 slot-meters connected, it took a considerable time to effect the alteration in the amount of gas given for 1d.; and then every penny of the money received represented a different number of cubic feet. When the price was 2s. 4d., the consumer got 26½ c.ft. for 1d.; when 2s. 6d., then 25 c.ft. for 1d. Therefore, when the price was increased, there was an apparent amount of unaccounted-for gas of 1½ c.ft. for every 1d. until the meters had been altered. This meant a large volume in the aggregate. As to the residuals, coke and breeze showed gross receipts amounting to £122,615, compared with £89,000 in 1915—an increase of £33,000. Unfortunately, there had been additional outlay in handling the coke and breeze, owing to the cost of labour; so that the net increase was £29,854. There was a slight advance in the receipts for tar and ammoniacal liquor. It was hoped that, when the new plant that was being put up at Southall was in working order, and they could get out more finished bye-products, there would be further considerable advantage in tar and liquor. The increase in the sale of gas and meter rents and residuals amounted to £75,000, as against £83,000 increase in the price of coal and oil; so that the one did not quite balance the other. The gross revenue was £725,122, and the gross expenditure £618,022. Therefore, the balance to profit and loss was £107,100. Deducting the interest for debentures and mortgage and overdraft, there was £90,700 profit on the year's working. The dividends to which the proprietors were entitled totalled to £96,814; so that the profit was short by £6114. He thought the proprietors would congratulate themselves that it was no more. It was indeed an exceedingly favourable position for the Company to be in. The shortage would come out of the undivided balance; so there would be rather less to carry forward to this year's accounts.

LARGE INCREASED CONSUMPTION DURING THE COLD WEATHER.

This year up to the previous day, they had an actual increase of 106 million c ft., as compared with the same days last year. When he mentioned that the increase of gas sold last year was 118 million c.ft., it would be seen that they were within 12 million c.ft. already of last year's total increase. This was a record certainly for the Company, if not for the gas industry. The plant was in good condition; and they had extended their large output at Staines, which was a distinctly promising part of their district.

AS TO THE FUTURE.

He could not speak as to the future—nobody could. They could only hope for the best. Any possible attention that could be given to the business, and anything that it was in the power of the Board to do, would be given and done. They could not control materials and transport, nor could they control wages. But the Directors would do their very best in the circumstances; and he knew they would have the loyal support of every man in the Company. Everything possible was being done for the future. They were installing wherever

they could labour-saving appliances. If they could only get labour and the delivery of material, he hoped they would be able to present as good a report this time next year, if not a more favourable one.

A LOST AND A NEW COLLEAGUE.

One other matter. They regretted greatly the loss of a very dear colleague—Mr. William King. It was a personal loss to every one of the Directors, to whom Mr. King's genial character was an exceedingly pleasant thing with which to come into contact. He had passed away after many years spent in the gas industry. He was on the Board of the Company nine years; and they were very sorry indeed to think he was not coming back to the Board. In his place, in pursuance of their powers, the Directors had elected Dr. T. Ethelbert Page. He was a gentleman who had had considerable experience of public and business life; and he (the Chairman) believed they would get a great deal of advantage out of his services on the Board.

Sir ROBERT SHAFTO ADAIR, Bart., seconded the motion.

Mr. GEORGE ENNIS referred to the Chairman's remark as to a larger extension of the business being possible if more capital were available. He suggested the issue of further capital, or a loan from the bankers. He congratulated the Directors and officers upon the position of the Company.

The CHAIRMAN explained that the Company were prohibited from issuing further capital. All the money possible was now wanted for the War Loan; and the Board did not think they ought to overdraw from their bankers for permanent extensions. Besides, there were the difficulties of materials and labour for structural work, as well as those of raw materials, transport, and labour in meeting an increased demand for gas.

The motion was unanimously carried.

THE DIVIDENDS.

On the proposition of the CHAIRMAN, seconded by Sir ROBERT SHAFTO ADAIR, dividends were declared at the rates per annum of 5 p.ct. on the 5 p.ct. preference stock, £5 10s. p.ct. on the "A" consolidated stock, and £5 7s. 6d. p.ct. on the "B" consolidated stock, all subject to income-tax.

RE-ELECTIONS AND VOTES OF THANKS.

Moved by Sir ROBERT SHAFTO ADAIR, and seconded by Mr. D. MILNE WATSON, the retiring Directors—Mr. R. J. Neville Neville, M.P., Brigadier-General A. H. Warlters Cowie, and Mr. H. E. Griffith—were re-elected.

Proposed by Mr. J. REESON, and seconded by Mr. G. E P. HODGE, the Auditors, Messrs. Monier F. Monier-Williams and Alfred Bevis, were re-appointed.

On the proposition of Mr. H. WELLER, seconded by Mr. REESON, a hearty vote of thanks was passed to the Chairman and Directors, to the Engineer and Manager (Mr. Alex. A. Johnston), the Secretary (Mr. J. T. Croxford), the staff, and the workmen.

The CHAIRMAN, in acknowledging the vote on behalf of his colleagues and himself, said he was afraid he had inflicted a long speech upon the proprietors; but this being their first annual meeting, instead of as formerly a half-yearly one, he thought he ought to go into their affairs in more detail. In conclusion, he heartily congratulated the proprietors on the splendid staff they had working for them. One and all thoroughly deserved all the good things that could be said of them.

Increased Salaries at Manchester.

By the decision of the Manchester City Council last Wednesday to grant a war bonus to men, women, and junior clerks, the employees of the Gas Department will benefit to the extent of several hundred pounds a year. The question has occupied the attention of Alderman Kay, J.P. (the Chairman of the Gas Committee) and Mr. F. A. Price (the Superintendent of the department) for many months past; and voluminous statistics have been collated upon the subject both for the Parliamentary Sub-Committee (of which the Chairman of the Gas Committee was a prominent member) and for the Gas Committee. Last week, however, matters were brought to a head by the Parliamentary Sub-Committee recommending to the General Purposes Committee that a war allowance of 6s. 6d. per week should be granted to all adult members of the administrative staffs, including accountancy and other clerks, collectors, inspectors, rental-clerks, &c., whose wages or salaries amounted to 26s. per week and upwards, but did not reach £300 per annum. The Committee also recommended that 3s. 3d. per week should be paid to junior officials under 21 years of age, and to women officials, and that the existing war bonus of 2s. should merge in such allowance. The recommendations were adopted by the Council.

Appeal for Economy in Consumption.—Very cold weather, and prevalence of fog, last week caused the Birmingham Corporation Gas Committee to issue an appeal for rigid economy in the use of gas by consumers. The difficulties of obtaining sufficient labour to pick up coal from stock, and the uncertainty of procuring regular supplies of gas coal and gas oil during the present abnormal conditions, are the reasons for the request. When twelve months ago a similar appeal was made, consumers, it is said, responded loyally; and the Committee hope that, now their output has enormously increased for munition work, all who are not using gas for that purpose will reduce their consumption by every means possible.

Swansea Gas Company.—The Directors, in presenting the statement of accounts for the year ended Dec. 31, recommend the statutory dividend at the rate of 5 p.ct. per annum (less income-tax) for the last half year. The major portion of the new issue of capital sanctioned in February last was readily taken up. Renewals and extensions to the manufacturing plant have been completed. Adverse conditions affecting the cost of production rendered imperative further increases in the price of gas as from the March quarter, and again in December. Notwithstanding the decrease in consumption due to the operation of the Summer Time Act, &c., the gas made for the year was only 2·86 p.ct. less. Benzol recovery plant is being installed; and the Directors are availing themselves of the special facilities to substitute for the existing illuminating power standard a calorific standard.

SKEGNESS GAS-WORKS PURCHASE ARBITRATION.

The Award.

In the "JOURNAL" for Dec. 19 last [p. 597] an account was given of the arbitration proceedings to determine the price to be paid by the Urban District Council for the undertaking of the Skegness Gas Company. It will be seen therefrom that the claim put forward for the Company was for £39,798; while on behalf of the Council £4200 was suggested as the proper figure. In both cases these amounts were subject to addition of £15,000 for loan capital; and the Council have also to pay the cost of the Company's opposition to their Act of 1915, the cost of the arbitration, and up to £100 for winding-up.

The Umpire (Sir Ryland Adkins, M.P.) has now issued his award, which is to the effect that the Council are to pay to the Company £23,541. To this, of course, has to be added the £15,000 loan capital, making £38,541.

NEWCASTLE AND GATESHEAD GAS COMPANY.

The Directors' Annual Report.

At to-day's meeting of the shareholders in this Company the Board will report that the revenue last year was £664,024, and the expenditure £540,745. To the profit thus shown, £123,279 is added the dividends received from the Redheugh Bridge Company, £525, and the balance brought forward, from 1915, £11,423. Already a year's interest on the Company's debenture stock, loans, &c., has been paid, £31,311, and interim dividends on the preference and ordinary stocks for the first half of last year, £44,866. Similar dividends for the second six months are recommended, at the rates of 4 and 4¼ p ct. respectively; and, on their being paid, there will be a sum of £14,184 to carry to the current year's accounts.

The following particulars as to the Company's position are given: The quantity of gas sold during the year was 4,016,029,000 c.ft.—an increase over 1915 of 219,684,000 c.ft., or 5·78 p.ct. The number of consumers on Dec. 31 was 125,734; being an increase of 1207 compared with the previous year. The issue of apparatus on hire was practically discontinued during last year, in consequence of the war. The new purifying plant at Elswick has been completed with satisfactory results. The new Act of Parliament, conferring additional powers upon the Company, passed last session as an unopposed measure after negotiations with the various local authorities. The greatly increased cost of the whole of the materials used by the Company—coal in particular—together with increased wages, rendered it necessary to raise the price of gas by 2d. per 1000 c.ft., commencing with the accounts due in April.

The accounts show that to the capital expenditure at the end of 1915, of £2,442,115, there was added last year £11,398. After allowing £28,754 for depreciation of plant, meters, stoves, &c., and reckoning the "nominal amount of stocks added on conversion," the total to the debit of the account is £3,252,330. The three classes of the Company's stock total to £2,655,764; and £309,926 has been added as premium capital. There is thus £206,640 unexpended.

Manufacture of gas cost for the twelve months £408,910; distribution, £74,587; public lighting, £768; rents, rates, and taxes, £22,234; management, £28,537; and sundries (including £3018 for insurance), £5710—totalling £540,745. Sales of gas realized £385,839; rental of meters, stoves, and fittings, £59,892; residuals, £216,600; and sundries, £1692—a total of £664,024.

The coal carbonized during the year was 369,430 tons; and the oil used was 306,876 gallons. The make of gas was 4423 millions, compared with 4180 millions in 1915. The residuals made were: Coke, 234,050 tons; breeze, 41,889 tons; tar, 3,564,233 gallons; sulphate of ammonia, 2973 tons. The number of public lamps supplied were less by 5 last year compared with 1915, and numbered 16,390.

TOTTENHAM LIGHT, HEAT, AND POWER COMPANY.

The Directors will report at the meeting next Saturday that the accounts for the half year to Dec. 31 show, after providing for interest and all other charges, a profit balance of £6138, which, together with the amount brought forward from the previous half year, leaves an available balance of £6428. The financial result for the period under review is wholly attributable to war conditions. The Directors have transferred the special war cost, amounting to £7308, to the insurance fund, which will increase the amount available for distribution to £13,736. The Directors recommend the payment of dividends at the rates (less income-tax) of 5 p.ct. on the preference stock, 5 p.ct. on the "A" stock, and 3½ p.ct. on the "B" stock. This will absorb a sum of £13,054, and leave £682 to be carried forward. In accordance with the provisions of the Tottenham and Edmonton Gas Act, 1913, the differential price of gas within the Enfield district was reduced by 3d. per 1000 c.ft. as from the December quarter readings. The Board report with deep regret the decease of Mr. J. L. Chapman, who was one of the Company's Auditors for seventeen years. Several gentlemen have intimated their desire to fill the vacancy; and the Directors recommend the name of Mr. William Cash.

The accounts accompanying the report show that the revenue from the sale of gas amounted to £149,696; rental of meters, stoves, &c., and the maintenance of incandescent mantles produced £30,296; residuals yielded £41,036; and the total receipts amounted to £221,311. The principal items of expenditure were: Manufacture, £155,827; distribution, £23,072; management, £6423—the total expenses being £203,086. The balance carried to the net revenue account is £18,371 (included in this item is £146, the balance brought from the electricity revenue account); and the total standing at the credit of this account is £13,736. The statements relating to manufacture show that in the half year 1,300,853,000 c.ft. of gas were made, and 1,131,334,000 c.ft. sold; the total quantity accounted for being 1,154,274,000 c.ft.

THE GAS LIGHT AND COKE COMPANY'S BILL.

The Position of the London County Council.

The Parliamentary Committee of the London County Council reported at last Tuesday's meeting that under the Gas Light and Coke Company's Bill, which is to be promoted in the current session of Parliament, it is proposed that further powers be conferred upon the Company with respect to finance and other matters. The Company seek: (1) Extended powers to purchase ships, lighters, and other vessels for the purpose of carrying on their undertaking; (2) power to hold an annual meeting, instead of half-yearly meetings; (3) the removal of a restriction placed upon the Company in 1903 which provided that the reserve fund should not be used to enable a dividend in excess of 4 p.ct. to be paid.

The Committee had been informed that any opposition to the Bill on the part of the Council must be undertaken under the provisions of the Borough Funds Act, 1872. As at present advised, they did not think it would be necessary to oppose it; but should it ultimately be found necessary, they would in due course recommend the Council to authorize the presentation of a petition in the second House.

The action of the Committee was approved.

THE MANCHESTER GAS ENGINEERSHIP.

Mr. William Newbigging's Appointment as Consultant Confirmed.

At the Monthly Meeting of the Manchester City Council last Wednesday, on the minutes of the Gas Committee, dated Jan. 19, coming up for confirmation,

Alderman W. KAY (the Chairman of the Gas Committee) moved their adoption, including the recommendation to temporarily engage Mr. William Newbigging as Consulting Engineer, at a remuneration after the rate of £1000 per annum. He explained that when Mr. J. G. Newbigging died the Gas Committee found themselves in the middle of a contract for over £100,000 worth of work, which was half completed, and which embodied many new features with which Mr. William Newbigging was quite familiar. Owing to the position they were in for gas making at Bradford Road, Gaythorne, and Rochdale Road, it was necessary that this work should be done with as little delay as possible. Hence the urgency of the present appointment—leaving the matter of the permanent selection of a Chief Gas Engineer for the future. Referring to the quality of gas now being delivered, he drew attention to the great scarcity of labour in the city.

Alderman BURTLES (the Deputy-Chairman of the Gas Committee) seconded.

Mr. THOMAS HOYLE congratulated the Gas Committee upon having continued the name of Newbigging in the history of the undertaking.

Alderman KAY said their Engineers were doing all they could to improve the quality of the illuminant.

The minutes were unanimously approved.

STOCKPORT CORPORATION GAS DEPARTMENT.

Carbonizing Extensions—Twelve-Hour Shift Proposal Abandoned.

The Gas Engineer and Manager (Mr. S. Meunier) presented a report at the meeting of the Stockport Town Council last week upon his investigation of the question of installing additional carbonizing plant for use next winter; and it was resolved that the Gas-Works Sub-Committee be requested to go into the matter of the extensions to be made at the works on the completion of the war, and to report thereon to the Gas Committee.

Mr. Meunier also reported that the Works Sub-Committee had further considered the question of going on to twelve-hour shifts, and after correspondence with the Municipal Employees' Association had informed the Association that the terms required by their members could not be accepted as a satisfactory settlement of the points raised. The Sub-Committee had therefore decided not to take any further action in regard to twelve-hour shifts. It was resolved that the action of the Sub-Committee be approved.

It was further reported that the braziers, tinsmiths, &c., employed by the Gas Committee had received an award from the Committee on Production of 3s. per week, to be regarded as war wages; and that, by an arrangement between the Operative Bricklayers' Association and the Master Builders' Association, an advance in wages of 1d. per hour had been conceded from Jan. 1.

The Engineer having advised the Committee that in his opinion it was advisable that they should consider the question of putting down a tar-distilling plant, it was resolved that he be requested to prepare an estimate of the cost.

A "Smokeless" England.—At the meeting last Saturday week of the Spenborough Engineering Society, Dr. Dufton, M.A., addressed the members on the subject of "A Smokeless England, and a Profit of a Hundred Millions a Year." He held that at the present moment fuel reform offered the greatest economy possible in this country; and that the likelihood of saving £100,000,000 a year was no fairy tale. To achieve this, he advocated the scientific treatment of the whole of our coal (with the production of smokeless fuel), the securing of the several valuable bye-products, and associated with these an alteration in the distribution of power. In regard to the comparatively recent introduction into this country of the bye-product coke-oven industry, as compared with the wasteful beehive system, he said the English business man had been so doubtful of anything scientific that he would not allow himself to be persuaded to embark on any new process of the sort. But he (Dr. Dufton) hoped that the appreciation of scientific facts would be greater in the immediate future—that our business people would be inclined to listen a little more to the experts in their own line.

SOUTH SUBURBAN GAS COMPANY AND THE CALORIFIC TEST.

Board of Trade Inquiry.

At the Offices of the Board of Trade last Tuesday, Mr. GARNHAM ROPER held an inquiry into an application by the South Suburban Gas Company under the Gas (Standard of Calorific Power) Act.

Mr. VESEY KNOX, K.C., and Mr. JACQUES ABADY appeared for the Company. There were five petitioners against the application, as follows: Beckenham Urban District Council, represented by Mr. HONORATUS LLOYD, K.C.; London County Council, represented by Mr. COURTHOPE MUNRO, K.C.; South Eastern and Chatham Managing Committee, for whom Mr. G. J. TALBOT, K.C., appeared; Bromley and Dartford Rural District Council, for whom Mr. A. J. LEES (Parliamentary Agent) appeared; and Lewisham Borough Council, for whom Mr. H. HOWARD (Gas Examiner) appeared.

Mr. VESEY KNOX, in explaining that the application of the Company was to have a calorific testing standard of 475 B.Th.U. applied to the whole of their area, said the present position was that, as regards a very large part of the area, there was a calorific standard of 540 B.Th.U., with a penalty point of 475—the latter being for all practical purposes the working standard. In the remainder of the area there was an illuminating power test; the candle power being 14, with a penalty when it fell below 13½ candles. The latter was prescribed in the Crystal Palace Gas Company's Act of 1906, when at the same time, as a *quid pro quo* for this reduction, the Company's standard price was reduced from 3s. 2d. per 1000 c.ft., with a neutral zone of 4d., to 2s. 9d., with a variation also in the sliding scale which was at present operating rather badly against them. Thus it was felt that the Company had made considerable sacrifices in order to get the lower candle power, whereas in more recent years such sacrifices were not asked by Parliament of promoters of Gas Bills in which it was sought to reduce the candle power. The position was that when the price of gas fell below 2s. 6d. per 1000 c.ft., the operation of the sliding-scale was in favour of the Company. It was common knowledge, however, that there was little prospect of the price of gas being reduced for some time to come. At present, the South Suburban Company's actual price was 2s. 10d. In 1912, the Company went to Parliament with a scheme for amalgamating the Bromley and Crays Company and the West Kent Company; and the terms were admittedly very favourable to the consumers in these districts. The London County Council petitioned against the Bill, and secured the insertion of a calorific power test over the greater part of the area; the local authorities in the remaining portion successfully resisting. At that time there was a good deal of difference of opinion as to what the calorific equivalent of 14 c.p. gas really was; but eventually 540 B.Th.U., with a penalty figure of 475, was inserted. The Company, however, had never worked below the penalty line. This agreement with the London County Council commended itself to practically everyone except Beckenham. As a matter of fact, in the area in which the calorific standard applied there were 53,718 meters; while in the area of the objectors, the number was only 12,757. In view of the inconvenience of having two tests in the same area, the Company asked for what was the real working limit—viz., 475 B.Th.U.—to be applied to the whole area. The London County Council, however, seemed to think it had made a bad bargain in 1912 in agreeing to 540 and 475, and now sought to have the whole position reviewed. But the Directors of the Company could not willingly give up their present rights without getting a reasonable equivalent, having regard to the price they paid for the reduction in candle power in 1906. If in the future it proved that (say) 520 B.Th.U. was better than 475, then some such arrangement as an increase in the standard price might make it worth while for the Company to agree to the change.

Mr. GARNHAM ROPER reminded Mr. Vesey Knox that Parliament had not sanctioned anything less than 500 B.Th.U. since 1914.

Mr. VESEY KNOX agreed, and replied that were it not for the fact that the Company paid so considerable a price for the reduction to 14 candles, the matter would stand on quite a different footing. It would not be sufficient reason, however, merely to advance the inconvenience of the two tests as a reason for the change. If this were the only reason, the proper course would be to go to Parliament and have the whole question threshed out. The war, however, had made the Company's position very different. Toluol had been taken out of the gas by tar-washing since the beginning of the war, and an oil-washing plant was now ready to be set to work. Thus it would be impossible to keep up the 14-c.p. standard.

Mr. HONORATUS LLOYD remarked that all gas undertaking were protected in this respect during the war.

Mr. GARNHAM ROPER said the breaking of the law in this matter had really been legalized during the war.

Mr. VESEY KNOX said the Company felt that the position would not be any better for some time after the war, owing to difficulties with coal and in other directions; and the question was, what should be done. The suggestion of the London County Council was that the calorific figure for penalties should be raised to 500 B.Th.U., and applied to the whole area. But it was quite clear that this could not be done by the Board of Trade under the Act of 1912. Another suggestion had been that 500 B.Th.U. should be applied to the area in which the illuminating power test now applied; but this was neither workable nor fair, because it was all the same gas, and it would be equivalent to applying 500 B.Th.U. to the whole of the district. The only other course was to make the standard the same as Parliament had already prescribed for the greater part of the area. What he therefore asked the Board of Trade to do was to make an Order specifying for the whole area a standard of 475 B.Th.U., to apply only during the war, the Company to come in the first available session of Parliament with a Private Bill for the purpose of putting the matter on a permanent basis. He made this suggestion because he appreciated the difficulty of the Board of Trade fixing 475 B.Th.U. as a permanent standard.

Mr. GARNHAM ROPER: We have never done it.

Mr. VESEY KNOX referred to the varying calorific standards that had been granted, and argued that even 500 B.Th.U., which was most commonly adopted now, could not be regarded as a standard;

while the present was an unusual case, because of the existence of the 475 penalty figure already in the greater part of the area. It was contended in the objections that 475 B.Th.U. gave a bad gas; and this raised the question of incombustibles in gas. This was a very difficult matter from the chemical point of view, as well as from the manufacturing and engineering points of view. It might be that there should be a limit placed upon the inert gases; but the difference between 475 and 500 B.Th.U. was practically nothing from this point of view. At the present inquiry, however, perhaps this was hardly a question to be discussed, as it must be dealt with as a permanent and not a temporary measure.

Mr. TALBOT, for the Railway Committee, said that while he did not suppose there was much difference of opinion among the experts on this question, he proposed to deal with it to some extent. His main case, however, was on pressure. If there was to be any reduction in the calorific value of the gas, then there must be a corresponding increase in the pressure. In the Sheffield case, 15-10ths was given with 500 B.Th.U. Consequently, with 475 B.Th.U. the pressure must be higher.

Mr. *Charles Hunt*, the Chairman of the South Suburban Gas Company, confirmed what Mr. Vesey Knox had said.

In cross-examination by Mr. HONORATUS LLOYD, witness maintained that gas of 475 B.Th.U. had been shown by the Company's tests to be 13½ c.p., which was the penalty figure in the part of the area in which the illuminating power test applied. He agreed that the Gas Light and Coke Company failed to secure the South Suburban calorific test in 1914, and that, in fact, Lord Clinton's Committee slightly raised the Gas Light and Coke Company's existing figure.

Answering Mr. TALBOT, witness argued that there was very little relation between calorific power and pressure, and down to 475 B.Th.U. there was very little advantage in having a higher pressure. According to a London County Council return, the proportion of incombustibles in South Suburban gas was 19½ p.ct.; and he saw no harm in that. He could not, however, say what proportion of incombustible gas would do harm. He objected to the gas being tested at the railway stations, as the Gas Company had no control there.

Mr. COURTHOPE MUNRO, for the London County Council, suggested that the whole object of the application was to get an increased standard price eventually. Witness, however, dissented, and said he doubted whether the Company would have brought the application at all had they foreseen that there would be so much opposition.

Mr. HOWARD, for Lewisham, complained to the Inspector that no notice had been given to the local authorities, and for that reason the application should be rejected.

Mr. VESEY KNOX said that Lewisham was not affected. In any case, its position was being looked after by the London County Council.

Mr. HOWARD, however, was permitted to take part in the proceedings, and put a few questions to the witness on the lines of those of Counsel for the London County Council.

Dr. *J. S. Rideal* was called mainly on the question of inert gases in coal gas. His records of tests during 1916 showed that only on a few occasions did the Company's gas fall below 500 B.Th.U. Comparing this gas with that of the Gas Light and Coke Company for similar periods, from the point of view of the percentage of inert gases, he found that the South Suburban percentage was lower. There was, for instance, 3·3 p.ct. of carbonic acid against 3·9 p.ct., 0·7 p.ct. of oxygen against 1·2 p.ct., 17·3 p.ct. of nitrogen against 19·7 p.ct. The total of the inert gases amounted to 24·8 p.ct. in the case of the Gas Light and Coke Company and to 21·3 p.ct. in the case of the South Suburban Company. The calorific value of the Gas Light and Coke Company's gas, calculated from chemical analysis, was 474 B.Th.U. The difference between 474 and 500 B.Th.U. did not materially affect the quantity of inert gases, which, in fact, were not a measure of the calorific value. He did not think the percentage of inert gases in the South Suburban gas was excessive, because it was almost impossible to keep them out, and the more so under war conditions.

In answer to Mr. HONORATUS LLOYD, on the question of the proper standard of calorific power, witness said he regarded all the decisions which gave the higher figures as wrong, because a 475 B.Th.U. gas would make a better article generally for lighting purposes than a gas of 500 B.Th.U.

Mr. HONORATUS LLOYD put it that the higher the percentage of inert gases the more must be used by the consumer to get the same result, yet the Company charged the same price per 1000 c.ft.

Witness agreed that the question of flame temperature came in, and that a gas without inert gases would give a higher flame temperature. It was possible that gases showing the same calorific efficiency on the calorimeter would have a different heating efficiency when used by the consumer; but the difference could not be very marked. With 5 p.ct. of inert gases, the flame temperature would be 3807° Fahr., while with 20 p.ct. inert gases the flame temperature would only be reduced by about 100°.

This closed the case for the Company.

THE OPPOSING BODIES.

Mr. HONORATUS LLOYD, speaking on behalf of the Beckenham Urban District Council, briefly related the history of the calorific power test through its successive stages in Parliament; the early precedents, so-called, being arrived at by agreement between the parties, and without consideration by a technical tribunal. Since 1914, however, the working minimum had been fixed at 500 B.Th.U., mainly as the result of the fight on the Gas Light and Coke Company's Bill in 1914. This applied both to Parliamentary Bills and Board of Trade Orders; and, having regard to this, it was a little surprising to find an application of this kind being made, unless there were some extraordinary circumstances. They had had it from Mr. Hunt that, had the magnitude of the opposition been foreseen, the application would probably not have been made at all. Apparently what the Company wanted was for the Board of Trade to give them something which they could barter with their opponents, or they wanted to be able to say to Parliament later on that the matter had been considered by a technical tribunal—the Board of Trade—and although the decision in favour of 475 B.Th.U. was only temporary, there should be no objection to applying it permanently to the whole of the district. Actually, the Company needed no protection during the war; and it was open for them to go to Parliament after the war and submit their case in the ordinary way. Any inconvenience at the present time was nominal; and the application was only for strategical purposes. The Company's real standard was 540, notwithstanding it was said that the practical working limit was 475; and he asked the Chairman not to be carried away by the suggestions made on behalf of the Company in order to get out of a difficulty. It was practically admitted that the application would never have been made but for the 1912 bargain with the London County Council; and he asked that any Order made should either increase the minimum over the whole district to 500 B.Th.U., or to that figure in the Beckenham area. The alternative, of course, was no Order at all.

Mr. *E. H. Stevenson*, who appeared as a joint witness for the Beckenham Urban Urban District Council and the Bromley and Dartford Rural District Councils (the two latter represented by Mr. Lees), expressed a preference for a definite figure without any margin before penalties began, and 500 B.Th.U. was a proper one in the present state of knowledge. As matters stood in the South Suburban Company's area, he saw no hardship in having the illuminating test in one part and the calorific test in another.

Answering Mr. VESEY KNOX, witness said he considered a 14 c.p. gas should have a calorific value of 550 B.Th.U. if the gas was properly made—*i.e.*, with the temperature of carbonization fairly high, and getting about 11,000 c.ft. per ton. He did not think the time had yet come for reducing the calorific value below 500 B.Th.U. for penalty purposes. He was in favour of standardizing the value of gas throughout the country; and if it could be shown that a standard gas could be supplied with a lower calorific value than 500 B.Th.U., then there should be general legislation for the whole country.

Alderman *R. W. James*, of Bromley, also gave evidence against the Company.

Mr. G. J. TALBOT, for the Railway Company, said that while not particularly concerned with the number of British thermal units, he saw no reason for departing from the 500, which was the usual practice now. With regard to pressure, however, it was admitted that a 475 B.Th.U. gas was less efficient than 500 B.Th.U. More gas had to be used to get the same result. Therefore, if 15-10ths was the proper pressure for a 475 B.Th.U. gas, then 20-10ths would seem to be about the right figure for a 500 B.Th.U. gas. The question of inert gases seemed to the Railway Company extremely important. It was possible to have gases showing the same result on the calorimeter, but giving quite different results in heating efficiencies when used by the consumer; and there must be some security that the gas tested by the calorific test was not adulterated beyond a certain point by the addition of inert gases. For this reason, the Company he represented was of the opinion that arrangements should be made for tests to be taken at their stations and goods-yards.

Mr. GARNHAM ROPER: You do not want testing stations at every railway station?

Mr. TALBOT: Yes; and we will put up the apparatus.

Dr. *Rideal*: And pay for the test?

Mr. TALBOT said he had not considered this. Continuing, he said that perhaps the Board of Trade might think this so definitely a new principle that it was more properly a matter for Parliament. If so, he would not press it.

Mr. *E. Moore*, technical expert in the lighting department of the London and North-Western Railway, gave the results of tests he had made, showing that with a fall in the calorific value there was a drop in the efficiency of the burners used. He also gave some figures of tests showing that more pressure is required as the calorific value of the gas goes down if the efficiency of the burners is to be maintained. Taking an exact ratio between 475 B.Th.U. and 15-10ths, the pressure with 500 B.Th.U. should be 25-10ths; but as 20-10ths was granted in the Sheffield case, he would be content with that.

At the concusion of this evidence, a note was passed across the table by Mr. Vesey Knox. Mr. Talbot thereupon informed the Chairman that the Gas Company would agree to 15-10ths if the calorific penalty point throughout the district was fixed at 475 B.Th.U.

Mr. COURTHOPE MUNRO, speaking for the London County Council, said although the Council were only affected as regards a small part of the Company's area, yet they had the right to oppose because whereas the Act of Parliament dealing with calorific value was a war measure, the Company were seeking to alter existing conditions. Apparently by agreement with the Railway Company, the Gas Company had restored the 540 B.Th.U. and the 475 penalty figure; while the suggestion that the Order should operate only during the period of the war and until the first Private Bill session also altered the position from what it was when the inquiry began. Nevertheless, the application was suspicious when it was endeavoured to see what the Company were going to get out of it, even if they got what they asked. He could not help thinking that it was in order to give them a good jumping-off point after the war to go to Parliament. His case was that a 14 c.p. gas involved at least a 500 B.Th.U. gas; and although the Council made a bargain in 1912 for 540, with a penalty figure of 475, subsequent knowledge tended to show that this was a bad bargain for the consumer. This having been put right in the case of the Gas Light and Coke Company, the Council now took the opportunity to do the same in this case.

Mr. *James Ollis*, Chief Officer of the Public Control Department, said that the intention of the 1912 bargain with the Company was that the 14 c.p. should be translated into terms of equivalent heating value. Tests, however, had shown that a 14 c.p. gas should be higher than 475 B.Th.U. As a matter of fact, the Council were of the opinion that the matter was one which could very well occupy the attention of a Special Committee; and if it had not been for the war, the Council would have urged upon the authorities that a special technical tribunal should endeavour to arrive at the correct figure. For a long time

there had been a tendency on the part of gas manufacturers—not intentionally—to increase the volume of incombustibles in gas; and from the consumers' point of view this was a dead loss. Whereas in 1904 there was 94·5 p.c. of combustibles in the gas tested, in 1916 this had fallen to 80·5 p.c. The Council regarded this as a very serious matter indeed.

Mr. A. J. LEES, for the Bromley and Dartford Rural District Councils, adopted the arguments and evidence on behalf of Beckenham.

Mr. HOWARD briefly stated the case in similar terms for the Lewisham Borough Council.

The Board's decision will be given in due course.

EAST GRINSTEAD COUNCIL AND CALORIFIC POWER.

In connection with the application to the Board of Trade by the East Grinstead Gas and Water Company, for an Order under the Gas (Standard of Calorific Power) Act, 1916, the Council recently intimated that, among other things, they desired a standard not lower than 540 B.Th.U., a pressure at least equal to the pressure now given, not above 10 p.ct. of nitrogen and carbon dioxide, the substitution of the Boys calorimeter for the one proposed, opportunity for revision of the Order two years after the war ends, some safeguard as to the price of gas, and also that the Company should, at their own expense, replace all flat-flame burners with an approved burner constructed for use with gas supplied under a calorific power test. When moving the adoption of the report of the Gas and Water Committee at last week's meeting of the Council, Mr. Steer said that he thought "the result justified the action taken."

The Committee, having received a copy of the draft Order, stated in their report that they were of opinion that the Board of Trade have given reasonable consideration to the objections lodged by the Council, as the Order provides, *inter alia*, that the testing apparatus shall be provided by the Company within three months, and be kept at the prescribed testing-place (*i.e.*, the Council Offices), the apparatus to be such as may be agreed upon between the Company and the Council, and failing such agreement to be similar to the apparatus from time to time prescribed by the Metropolitan Gas Referees, and be used in the mode and under the conditions for the time being prescribed by the Metropolitan Gas Referees. The pressure at which the gas is to be supplied is to be not less than 15-10ths. On application by any consumer within two years, the Company have to supply and fix free of charge flat-flame burners, suitable in all respects for the consumption of gas of the standard calorific power, in substitntion for any burners (not being incandescent burners) in use by the consumer before the date of the Order; and notice of this condition has to be given on each demand note of the Company for a period of two years. The Order is subject to revision at the expiration of five years. The Committee regret that the standard of calorific power prescribed by the Order is 500 B.Th.U., instead of 540, as suggested by the Council. In regard to the condition as to the substitution of flat-flame burners, the Committee drew attention to the fact that a very large proportion of the consumers of gas using flat-flame burners are persons who obtain their gas by means of the slot-meter system, and will therefore not have notice of the condition imposed on the Company, as demand notes are not served in such cases. It was therefore recommended that the Council should ask the Company to give notice of the condition by newspaper advertisement or handbills; and, failing compliance with this request, the Council should do so.

STRETFORD COUNCIL AND THE NEW STANDARD.

The application of the Stretford Gas Company to the Board of Trade for a calorific standard of 500 B.Th.U. in place of an illuminating power standard, was the subject of a lengthy resolution passed at the last meeting of the Urban District Council.

The Clerk said he had sent a letter to the Board of Trade expressing regret that the Board had arrived at a decision without giving the Council an opportunity of being heard upon the application, and stating that the Council had just received the report of their Consulting Engineer, and were laying before the Company a proposal (without prejudice) that, having regard to the Company's obligation to conform to the statutory standard of 16 c.p. ascertained by test with Sugg's "London" argand burner No. 1, the calorific standard in the proposed Order should be fixed at 550 B.Th.U., with a 5 p.ct. margin, as in the case of the Liverpool Gas Act of 1914 and the Hightown Gas Act of the same year. The Council further considered that the place of test should be such as may be agreed between the Council and the Company, or, failing agreement, as may be determined by the Board of Trade. The Council at the least expected that the Board would communicate with them before proceeding to make the Order; and the Clerk asked whether it might still be possible for the Council to be heard on the points herein raised.

The resolution of the Council was in the following terms:

That the Council view with concern the proposal of the Board of Trade to make an Order under the Gas (Standard of Calorific Power) Act, 1916, substituting for the present statutory standard of 16 c.p. (Sugg's No. 1 argand burner) a calorific standard of 500 B.Th.U., without first giving the Council an opportunity of being heard by their technical advisers on the application.

That, inasmuch as Stretford gas consumers are to-day entitled by statute to an illuminating value of 16 c.p. and a heat value of over 600 B.Th.U., the total abandonment of illuminating value and the substitution of a heat value so low as 500 B.Th.U. is unreasonable.

That, in the special circumstances of the present application, a standard of at least 550 B.Th.U., subject to a 5 per cent. margin, is considered fair and reasonable and justifiable by precedent.

In this connection, the Board of Trade are reminded of Mr. Pretyman's assurance on behalf of the Board on the second reading of the Calorific Power Bill, to the effect that the Board would give due effect to the interests of consumers.

GAS COMPANIES AND THE SALE OF SULPHATE.

A Question of Warranty.

The Southampton County Council have received a report on an important matter as to fertilizer warranties. The Board of Agriculture, as is well known, have arranged with the Sulphate of Ammonia Association that sulphate shall, during a certain period each year, be sold at 15s. per cwt. net cash, on the basis of 24½ p.ct. of ammonia.

Last autumn, a farmer in the county applied to one of the large gas companies in the south of England to purchase a quantity of sulphate of ammonia, 24½ p.ct. ammonia, in accordance with the terms of the Board's arrangement. The company declined, in the first place, to supply the sulphate at the price arranged; and the assistance of the Board had to be invoked before the company would agree to do this. The company stated that the article must be accepted as produced at the works; declined either to give a guarantee as to the percentage of ammonia which it would contain, or to agree to a sliding-scale varying with the percentage of ammonia found upon analysis, although several applications were made; and failed to give the invoice required by the Act, which would have constituted a warranty of the amount. The farmer reported the circumstances to the General Purposes Committee of the County Council.

The Committee carefully considered the circumstances, and were satisfied that it was a case in which, in the interests of farmers and others requiring to purchase fertilizers, proceedings should be taken for an offence against the Act; and they accordingly applied to the Board for consent under the section referred to.

The Board communicated with the company; and upon the information supplied by them, and without any further communication with the Committee, decided that a prosecution was not desirable. The Committee pointed out to the Board that their decision appeared to have been arrived at after hearing one side of the case only, and supplied the Board with a summary of the evidence which was available in the event of a prosecution taking place. The Board still adhere to their decision that no useful purpose will be served by a prosecution.

The Committee regard the Board's decision as an unfortunate one. That the offence was committed cannot be disputed, and appears now to be admitted by the company to the Board. The Committee are satisfied that the refusal to give a guarantee or particulars of the percentage of ammonia was deliberate, and was maintained in spite of repeated requests. The Act provides that proceedings for offences shall not be instituted without the consent of the Board; and it is no doubt desirable that the Board should be enabled to prevent the institution of proceedings unless there is a clear *primâ facie* case that an offence has been committed. The Committee do not, however, regard it as satisfactory that, where there is a clear *primâ facie* case, the department should take upon themselves duties which are essentially duties for the Justices—namely, determining as between conflicting evidence and deciding whether an offence is established, and, if so, whether any, and if so what, penal proceedings should be taken.

GLOVER AND MAIN'S WAR LOAN SCHEME.

A meeting of the employees of Messrs. Glover and Main, Limited, of Gothic Works, Upper Edmonton, was held last Friday, to assist the War Loan. Mr. Thomas Glover (Managing-Director) presided; and he was supported by Mr. R. B. Main (Chairman) and various members of the staff.

The staff and employees are taking up the new War Loan under the following scheme, which the Company have formulated.

5 P.CT. WAR LOAN.

The Company offer to make arrangements whereby payments may be made by weekly instalments to be deducted from wages. An amount (to be determined by the number of subscribers) will be advanced by the Company for the purchase of War Loan stock. This stock will be held in the hands of two Trustees appointed by the Commercial Bank of Scotland. All payments will accumulate interest at the rate of 5 p.ct. per annum.

The method of working the scheme is shown by the following example: An investor wishes to subscribe for a £5 War Loan certificate. A deduction is made from his wages of 2s. per week; the first deduction being made on Feb. 17, and 2s. each week thereafter, for 46 weeks; in the 47th week, 1s. 2d. only will be deducted. The subscriber has thus paid £4 13s. 2d., and in return receives a War Loan certificate for £5. As the amount payable for a £5 certificate is £4 15s., it will be seen that interest amounting to 1s. 10d. has accrued on the weekly payments, which is at the rate of 5¼ p.ct. per annum. An investor may, if he so desires, take up £10 or £15 (or more), in which case the weekly deductions will be 4s. for £10 and 6s. for £15 for 46 weeks, and 2s. 4d. and 3s. 6d. respectively for the 47th week.

£1 WAR SAVINGS CERTIFICATE FOR 15S. 3D.

The Company are also prepared, in the case of those earning smaller wages, to purchase War Savings certificates, to be paid for at the rate of 6d. per week for 30 weeks and a final payment of 3d. This allows for interest at the rate of 5 p.ct. per annum. On the last payment being made, the certificate will be handed over to the subscriber. Arrangements can also be made to purchase these certificates for cash at the issued price 15s. 6d.

Loughborough Gas-Workers' Wages.—The Loughborough Town Council have dealt with applications for increases of wages in the Gas Department; the responsible Committee reporting that information had been obtained as to remuneration in other districts. It was decided to concede numerous advances, including ½d. an hour to the whole of the fitters and mainlayers; the present wages ranging from 7d. to 8¼d. per hour. An allowance of 1s., in addition to payment for ordinary time, is also made to men employed on Sundays in connection with certain mains.

STRETFORD GAS PROVISIONAL ORDER.

The Stretford Gas Company have declined to accept the following proposed amendments as a condition of the Stretford Urban District Council's consent to the Company's application for an Order to extend their powers for the manufacture and conversion of residual products arising in the manufacture of gas, and to amend the Stretford Gas Act of 1899:

(1) The manufacture of residuals to be limited to those arising from the manufacture of gas by the Company.
(2) The Company to use modern approved appliances, and the process to be free from public nuisance.
(3) Effective prevention of the discharge of gaseous or noxious liquids into the district sewers or neighbouring watercourses.

The Council have resolved that the Clerk be authorized to petition the Board of Trade as may be necessary against the Company's application, and to take all necessary steps to secure an amendment of the Order on the lines indicated.

SULPHATE OF AMMONIA.

Selling Price Fixed.

The Food Controller, with the concurrence of the Agricultural Departments of Great Britain and Ireland, has approved of an arrangement whereby, on or after yesterday, sulphate of ammonia is to be sold at the price of £16 per ton, 24½ p.ct. basis, in makers' bags, net cash, delivered at the consumer's station in any part of the United Kingdom. The price to consumers who take delivery at the producer's works, for conveyance otherwise than by railway, remains at £15 10s. per ton. In the event of purchasers experiencing difficulty in obtaining supplies locally, they are advised to apply to the Secretary, Sulphate of Ammonia Committee, No. 84, Horseferry Road, London, S.W.

The Food Controller has appointed, with the concurrence of the Agricultural Departments of Great Britain and Ireland, the following Committee of manufacturers of sulphate of ammonia to advise him with regard to questions affecting its production and distribution, and to give effect to an approved scheme for regulating the distribution of supplies to farmers in all parts of the United Kingdom:

Mr. D. MILNE WATSON (Chairman), Gas Light and Coke Company.
Mr. WM. FRASER, Pumpherston Oil Company, Ltd.
Mr. E. J. GEORGE, Consett Iron Company, Ltd.
Mr. W. R. HANN, Powell Duffryn Steam Coal Company, Ltd.
Mr. N. N. HOLDEN, Messrs. Hardman and Holden, Ltd.
Mr. A. K. M'COSH, Messrs. Wm. Baird & Co., Ltd.
Alderman F. S. PHILLIPS, Salford Corporation Gas Department.
Mr. A. STANLEY, Messrs. Simon-Carves, Ltd.
Mr. F. C. O. SPEYER, Secretary.

THE BANKRUPTCY OF F. O. PRESTON.

Mr. E. H. Hawkins, Trustee in connection with the bankruptcy of E. O. Preston, "financier," under a receiving order dated Oct. 18, 1910, has issued to the creditors a report and statement of accounts in the matter. The bankrupt's name will be familiar to readers as the promoter of some of the little gas companies which at one time called for, and received, destructive criticism in the "JOURNAL."

In the course of his report, Mr. Hawkins says that since the first dividend was paid it has been necessary to wait for certain money to be received from the Chancery Court in connection with various debenture holders' actions in which he found the bankrupt's estate had an interest; and until the debenture holders' action had been brought to a conclusion, and other matters settled, the estate could not be closed.

A final meeting of the Committee had been held, when the Trustee's accounts were approved of and a general report given on the matter. It was anticipated that the moneys coming in would have enabled a further small dividend to be distributed; but this was impossible, in consequence of the numerous unscheduled claims made against the estate, many of which, on investigation, the Trustee had had to admit, and others had been reduced, and which amounted to £10,702 more than scheduled by the bankrupt. These claims had been carefully scrutinized. The total gross amount of the proofs lodged was £59,811 12s. 1d.; while the amount admitted was £39,205 12s. 4d.

In consequence of the bankrupt's involved transactions, the proceedings had been extremely complicated, more especially as it was found certain assets were in the names of nominees which were only traced after the result of an examination before the Court by the Trustee of certain persons and documents. These principally consisted of 40 debentures in gas and water companies which were not disclosed by the bankrupt, and which had produced about £275.

Legal proceedings also had to be taken in order to get in the bankrupt's interest in other companies with which he had been associated; and the amount recovered was much in excess of the costs incurred incidental thereto. Within three days of filing his petition, the bankrupt gave a second mortgage over some Guernsey property to his brother. This the Trustee was able to get handed over to him, and realized £363 from such property over a prior mortgage. The amount was included in receipts from securities.

It was to be regretted that the dividend paid was only small, and that nothing more could be obtained; but in view of the heavy liabilities and the small amount of the assets, it had been impossible for any other result to be brought about.

A private Company has been formed, with a capital of £25,000 in £1 shares, to carry on the business of W. A. Ward & Co. makers of incandescent gas-mantle rings.

NEWCASTLE (N.S.W.) GAS COMPANY'S JUBILEE.

The City of Newcastle (New South Wales) Gas and Coke Company, Limited—having been established in 1866—were some months ago celebrating their jubilee. Naturally, the beginnings were small. By the end of 1866, the Company's Act of Incorporation had been passed; and the plant for the works arrived in the September following. By the end of 1867, the gross proceeds from gas supplied to private consumers had amounted to £119; while for the half year ended Dec. 31, 1868, the gas rates aggregated £862, and two years later a dividend at the rate of 6 p.ct. per annum was declared. The price of gas, which until then had stood at 15s. per 1000 c.ft., was in August, 1874, reduced to 12s. 6d. At the close of the next year, the streets were for the first time lighted by gas. Always enterprising, the Company have seized opportunities as they arose of extending their sphere of operations; the latest example being the laying of a submerged main across the Hunter River for the supply of the town of Stockton with gas from the Newcastle works. An illustrated description of this work, which was carried out by Mr. John Mackenzie (the Company's Engineer), whose scheme it was, will be found on p. 442 of the "JOURNAL" for Nov. 28 last year.

Proceeding with the history of the undertaking, which is set out at length in a "Jubilee Souvenir," it may be said that, in 1887, the Directors, acting on the advice of the responsible officers of the Company, decided to largely increase the capacity of the works, in view of the growth of the city and suburbs, and of the greater demand for gas. Accordingly, a gasholder of nearly 400,000 c.ft. capacity was ordered from England, together with subsidiary plant; and a new retort-house was erected. To carry out this work, more land had to be purchased. The result, when the gasholder and other buildings and machinery were constructed, was a plant at that time not inferior to any in Australia. During 1887 and 1888 a time of depression in business took place; but this did not deter the Company going on with the extensions of the works and plant, nor from reducing the price of gas. On Jan. 1, 1887, the price was fixed at 6s. 8d., and a year later at 6s. 3d. per 1000 c.ft. In 1890, the Directors had to report to the shareholders that the cost of production of gas had been increased owing to the high price of coal, due to strikes. Notwithstanding this fact, the price of gas to consumers was not increased; and on Jan. 1, 1892, the charge was brought down to 5s. 3d., and six months later to 5s. per 1000 c.ft. By July 1, 1901, the price had got down to 4s.

Early in 1903, Mr. A. Langwill, after about twenty years' service as Secretary, was made Manager of the Company; and the wisdom of the appointment has been apparent in the progress which the undertaking has made under his direction. The modest capital with which the Company had commenced operations had been increased from time to time, until it stood at £45,000 in 1909. At a special meeting that year, the Directors asked for authority to increase the capital to £67,500. The authorized capital is now £298,665. From Aug. 1, 1910, the price of gas stood at 3s. 9d. per 1000 c.ft.

In 1910, proposals were afoot for the erection of new works at Clyde Street, Hamilton; but the management wisely decided, in view of late developments in the carbonization of coal, to postpone their erection as long as possible, in order to be able to take advantage of the most approved methods of gas making, in the light of the experience gained in England and Europe. The need for new works was fully recognized, and had been brought about by the large increase in the Company's business during the decade then closing, and by the wide extension of the mains. The land required had been secured; and by the end of 1910 the preliminary work on the new site had been entered upon. A railway siding had been put in; and a connecting high-pressure main had been laid between the old works and the new site. Then, the type of plant having been agreed upon, the work advanced rapidly, with the result that the making of gas at the new works commenced on Jan. 21, 1913. The works were completed under the personal supervision of Mr. Mackenzie; and the plant is declared to be one of the finest in the Commonwealth. The report of the Consulting Engineer (Mr. A. Wilson) on the works is a testimony to their skilful erection, and to their efficiency. He said: "The completed work has been excellently carried out, and reflects credit on the Engineer and Contractors; and the works as a whole constitute one of the best examples of efficient and economical gas-making plants I have yet seen."

The plant is on the Glover-West system of vertical retorts, and consists of 32 retorts arranged in settings of eights; each set of eight retorts being heated by a separate producer. The retorts are 20 ft. long, tapering slightly from top to bottom, in order to facilitate the passage of the coal and coke. The producer gas for heating the retorts is conveyed to the settings, and fed in at eight different points in the height of the retorts, where it meets with its proper quantity of preheated secondary air necessary for complete combustion, and then circulates round the flues in contact with the retort. After the gases have done their work here, they are conveyed by a separate flue to the two circulating chambers at the top of the retorts, where the heat is not required to be so intense, and thence to the chimney. By this arrangement, the heats of the retorts are completely under control, and can be increased or reduced at whatever point is desired in the length of the retort.

The gasholder has a capacity of 400,000 c.ft. In addition to the very fine and complete plant for the making of gas, there are a splendid laboratory and testing-rooms. Here the official testings are carried out for illuminating and calorific power, under the New South Wales Gas Act. The stores are also adjacent to the offices. On the other side of the entrance are the buildings containing the plant for the measuring, governing, and distribution of the gas. The whole of the plant is working satisfactorily. The selling price of gas is now 3s. 6d. per 1000 c.ft.

The make of gas in 1916 was 278 million c.ft.; and at the present time the Company have in use 7315 ordinary meters, and 3832 slot-meters, or 11,147 in all.

Since July, 1910, Mr. John R. Hall has been Chairman of the Company. In 1914, Mr. Langwill was made General Manager. For a short time after formation, the Company were advised by Mr. Barlow

and Mr. A. K. Smith (the latter of Melbourne) as Consulting Engineers. But once the works were got under way in 1867, Mr. Thomas Reid was appointed Engineer; and he continued to act in this capacity until December, 1906. Mr. Cowper-Smith filled the office for a few weeks, but returned to England; and in January, 1907, the Directors selected for the position Mr. J. Mackenzie, who is still with the Company.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Feb.* 12.

There is a fairly steady demand for pitch, and the price is firm at 23s. to 24s. per ton net in bulk at makers' works. The position of creosote remains unaltered; unsold quantities being taken over by the Government on the terms previously mentioned. There is a fair demand for various purposes in the home market, at prices ranging from 4d. to 4¼d. per gallon net in bulk at makers' works. 48-50 p.ct. anthracene is 3d. per unit net, casks free, and 90-160 p.ct. naphtha is 2s. 2d. to 2s. 3d. per gallon net and naked, both at makers' works.

In sulphate of ammonia the export position remains unchanged. For home trade the demand continues at prices fixed by Government.

Tar Products in the Provinces.

Feb. 12.

There is no alteration in the market for tar products.

The average values of gas-works products during the past week were: Gas-works coal tar, 19s. 9d. to 23s. 9d. Pitch, East Coast, 16s. to 16s. 6d. per ton; West Coast—Manchester 15s. to 15s. 6d., Liverpool 16s. to 16s. 6d., Clyde 17s. to 18s. Benzol, 90 p.ct., North, 10½d. to 11½d.; 50-90 p.ct., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 3d. Coal tar crude naphtha, in bulk, North, 6¼d. to 6½d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 9d. Heavy naphtha, North, 1s. 2d. to 1s. 3d. Creosote, in bulk, North, 3¼d. to 3⅜d. Heavy oils, in bulk, North, 3⅜d. Carbolic acid, 60 p.ct., East and West Coasts, 3s. 4d. naked. Naphthalene salts, 80s., bags included. Anthracene, "A" quality, 2¾d. to 3d. per unit; "B" quality, ⅝d. to 1d.

Sulphate of Ammonia in the Provinces.

LIVERPOOL, *Feb.* 10.

During the past week there has not been any change in the situation, the authorities having continued to refuse to grant licences for all destinations, and no fresh export business has been reported in any position. The special prices for fertilizing in the United Kingdom are still £15 10s. per ton to farmers, and £15 to mixers and distributors, net cash on rail at makers' works.

Nitrate of Soda.

The value of this material has advanced further, and holders on spot now require 22s. 3d. per cwt. for ordinary quality and 22s. 6d. for refined.

Sulphate of Ammonia.

Export is still prohibited, and therefore no export prices are quoted. Home values remain the same.

COAL TRADE REPORT.

Northern Coal Trade.

Trade is rather irregular, with shipments limited through the lack of ready tonnage, and influenced also by the present condition of the mercantile marine. In the steam coal trade best kinds retain firmness, but other qualities vary in prospect at the different collieries. Best Northumbrian steams are about 30s. per ton f.o.b.; second-class qualities are rather changeable, at from 21s. to 24s., according to time of delivery and the condition of the trade at different collieries; steam smalls are quiet generally, and are quoted from 17s. to 20s. The steam coal trade is now receiving a full output; but the loading difficulties interfere with its regular disposal, and these are added to by the high freights to some of the neutral countries. In gas coal, the home inquiry is brisk; and this, and fair shipments to France, keep this branch of the trade relatively steady. Best Durham gas coals are from about 25s. to 25s. 6d. per ton f.o.b.; second-class qualities are rather dull at about 18s. to 19s. 6d.; while "Wear specials" are quieter at from 28s. 6d. to 31s. The local demand for gas coal is good, even for this season of the year; but it now begins to show the decrease which is beginning with the longer days. Shipments are steady in the circumstances; but the rate of freight on gas coal is still shown by the Tyne to London figure being near 16s. per ton, though there are many time charters running at lower rates. Coke is in good demand, both for home use and for export. Good gas coke is from 32s. to 33s. per ton f.o.b. in the Tyne; and the freight on coke to the northern ports of France is from about 45s. per ton Tyne to Havre.

The South Metropolitan Gas Company have lost their vessel, the *Ravensbourne*, which was sunk recently when on its way to the works with some 2000 tons of coal. Unhappily, too, the occurrence was accompanied by the loss of three lives—those of the chief engineer, the second engineer, and the donkey man. The boat had only been running since July of last year.

Newport (Mon.) Gas Company.

The half-yearly meeting of the Newport (Mon.) Gas Company was held on Monday of last week, when Mr. G. Geen, who presided, said that a short while ago the Government requested them to put down additional benzol plant. This they were doing at very considerable expense, and with much difficulty, owing to the fact that about 40 p.ct. of their men had been taken from them. While they were ordered to do this work by the Government, the Tribunals were taking from them trained men who were absolutely essential for carrying out the orders. As to the revenue account, the manufacture of gas represented an increase of £2600 over the December half of 1915, due exclusively to the increased cost of coal, oil, materials, and wages. This resulted in their being about £800 short of the amount necessary to pay the statutory dividend and interest on debentures. While coal and oil prices were so abnormal, the general position would be very seriously affected if it were not possible to ask the customers to take a share of the burden. Since June 1, the Company had borne the additional 2s. 6d. per ton placed by the Government on coal; but now the Board felt it absolutely necessary to increase the cost of gas 3d. per 1000 c.ft. as from Dec. 31 last. In spite of the severe lighting restrictions, there was a small increase in the consumption of gas to be reported—just over 1 p.ct. for the half year. The sale of nearly 200,000,000 c.ft. of gas was a record for the Company. On profit and loss account there was a balance of £2594 brought forward, to which had to be added the present balance of £7804, making a total of £10,398. After the payment of interest on debenture stock and the statutory dividend on the consolidated stock, there would be left £1789 to the credit of the current half year. Altogether he thought they would agree that the Company had come through a difficult time with fairly satisfactory results. This was largely due to the foresight, energy, and ability of the Engineer (Alderman Thomas Canning, J.P.), the Manager (Mr. J. H. Canning), and their staffs. He also paid a tribute to the Secretary (Mr. T. H. Hazell) and his staff.

Derby Gas Company.—The report of the Directors records that business has been satisfactory, especially considering the further restrictions regarding curtailment of lighting and the difficulties of transport and shortage of labour. Additional land has been purchased adjoining the Litchurch works, to enable the Company to comply with requirements of the Minister of Munitions. An interim dividend at the rate of 5 p.ct. per annum has been paid for the half year to June 30 last, and the Directors now recommend the payment of the standard amount on the consolidated stock, at the rate of 5 p.ct. per annum for the half year to December, with an additional ½ p.ct. for the whole year, making 5½ p.ct., less income-tax. They regret the loss which the Company have sustained by the death of the late Chairman, Mr. George Gascoyne, who had been a member of the Board for 25 years and Chairman for 11 years. They have elected as his successor Sir Henry G. Ley, Bart. The Company have taken up £60,000 of 5 p.ct. war stock, of which £20,000 is new money.

Sulphuric Acid Difficulties at Aldershot.

The accounts of the Aldershot Gas, Water, and District Lighting Company for the half year ended Dec. 31 show that the total revenue was £54,606, and the expenditure £43,879, leaving a surplus of £10,727. After providing for dividends on the preference stock and interest on the mortgage, special loans, and debenture stock, the Directors recommend the full statutory dividends of £5 18s. p.ct. per annum on the "A" stock, £4 8s. p.ct. on the "B" stock, and £5 p.ct. on the "C" consolidated stock, all less income-tax, for the half year. In submitting the accounts, the Directors say that the severe lighting restrictions, together with the operation of the Summer Time Act, have again temporarily arrested the sales of gas, which for the six months (excluding public street-lamps and War Department contract) show a decrease of 4·12 p.ct. Owing to unavoidable delay in completing certain retort-house replacements, an increased quantity of oil gas had to be manufactured over a large portion of the half year. Gas oil has advanced considerably in price, and is not easy to procure. The Company, however, have not been very seriously handicapped so far in this respect, owing to arrangements made earlier in the war. The larger quantity of oil gas necessarily reduced the residuals for sale. The price of sulphuric acid has advanced about 100 p.ct. as compared with that operating for the corresponding period of 1915, and the quality has been at times very inferior. These influences have been felt, together with general difficulties in obtaining supplies, which means holding larger liquor stocks—at times straining the storage accommodation. Intermittent manufacture is the outcome. So much has this question been at issue, that at times it has been felt that it would be better to suspend the manufacture of sulphate of ammonia altogether, and dispose of the ammoniacal liquor in its crude state. Notwithstanding these adverse conditions, the Company have disposed of the greater portion of the sulphate made during the half year, for home consumption, which has been at some financial sacrifice. The Electricity Department has now completed the second year's working, with an increase in sales of 75·54 p.ct., and improved working profit. Increased expenses have been experienced generally.

History of a Gasholder.—Repairs to the No. 1 gasholder at the Inchgreen Gas-works of the Greenock Corporation, which are nearing completion, serve to recall the interesting history of the holder, which is 57 years old, having been originally erected by Messrs. Hanna, Donald, and Wilson, of Paisley, for the gas-works in the Glebe. It was cut in sections when the works were removed to Inchgreen, and floated on rafts up to near its new site. The same firm have carried out the original erection, the taking down and re-erection, and now the overhaul and repair of the holder. The present work includes the provision of a new cup and grip and lower row of side sheets and several new plates on the crown and top row of sides. With this repair, the holder is confidently expected to have many more years of usefulness.

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The "St. Nicholas" Gas Fire is a happy combination of the three essentials:

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Toluol without Compensation.

The Bolton Gas Committee have received a letter from the Town Clerk of Stockton-on-Tees intimating that the Gas Committee of that Corporation had had under consideration the fact that, notwithstanding the Government requirements as to toluol, no payment was being made by the Government to the various gas-works or compensation in any other form being given. The Stockton Council were of opinion that this was unfair, and that it would be well if corporations owning gas-works took concerted action, so as if possible to obtain payment for the product supplied. The Town Clerk said he would be glad to learn whether the Bolton Committee approved of the suggestions made in the matter. It was decided to defer consideration of the question pending a conference on the subject between the Gas Engineer and the Town Clerk.

Newry Gas Undertaking.

The report of the working of the Newry gas undertaking for the year ended March last has been submitted to the Urban Council. It shows an expenditure of £7591, against £7137 in the previous year, and receipts £9377, compared with £9111. The sale of gas realized £6166, against £6030. On the manufacture and sale of gas account there was a gross profit of £1785, compared with £1974. The balance-sheet gave a credit of £16,366. The gas made during the year was 36,496,000 c.ft. The Consulting Engineer (Mr. Isaac Carr, of Widnes) reported that the working of the purifiers with native bog ore in place of lime continued to be efficient; and that, while prior to the change in purifying material the purifiers were changed every three weeks, the period of changing had now been extended to about three months. The improvements in the working results of the undertaking generally were such that, but for the abnormal price of coal, a substantial reduction might have been made in the selling price of gas.

Otto Coke-Oven Company "All British."—We are informed by Mr. W. H. Pyecroft (the Commercial Manager and Secretary) that the Otto Coke-Oven Company, Limited, whose head office is at Post Office House, Leeds, is now "All British, with regard to the proprietary, management, and staff" The shares formerly held in the Company by alien enemies have been purchased from the Public Trustee by the existing British shareholders.

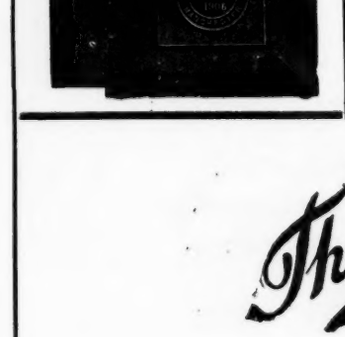
Maximum Gas Prices in Ireland.—The question of securing an increase in the maximum price statutorily allowed to be charged for gas has been considered by the Ballymena Urban Council, who decided to join with the Lisburn and other Councils in urging the necessity for a Bill to extend the powers so as to allow the maximum to stand at a higher figure. The Ballymena maximum price is 5s. per 1000 c.ft., as against 4s. in Lisburn and 4s. 6d. each in Lurgan and Omagh.

Portsea Island Gas Light Company.

The report which the Directors will present at the half-yearly meeting on Thursday states that, as had been anticipated, the increassd cost of the production of gas for the six months ended Dec. 31 was considerably in excess of the yield from the increased price charged to consumers. The profit and loss account, however, shows an available balance of £27,430, which enables the Directors to recommend the declaration of a dividend for the half year at the full statutory rates per annum of 12 p.ct. on the "A" and "B" shares, 11 p.ct. on the "C" shares, 9 p.ct. on the "D" and "E" shares, and 5 p.ct. on the 5 p ct. maximum stock—less income-tax. This will leave a balance of £10,356 to be carried forward. Although the number of consumers increased, and an additional number of hired appliances was fitted, owing to the Summer Time Act, the earlier closing of shops, and the temporary discontinuance of the majority of the street-lamps, the quantity of gas sold was 5·21 p.ct. less than during the corresponding period of the previous year. The great difficulties due to the abnormal industrial conditions have become further accentuated—more especially the serious shortage of labour; and the resources of the management have been severely taxed in maintaining the gas supply. At the request of the Ministry of Munitions, plant for the recovery of substances from which high explosives are manufactured, and which after the war are likely to be of considerable value for industrial purposes, has been installed and brought into use at the Hilsea works. Application has been made to the Board of Trade under the Gas (Standard of Calorific Power) Act, 1916, for an Order for the substitution of a calorific power standard of the gas supplied in place of the present illuminating power standard. The revenue account shows receipts of £142,324, as against £135,303 in the corresponding half year; while the expenditure was £132,672, compared with £118,229. The total quantity of gas sold was 696,744,400 c.ft., as against 735,059,800 c.ft.

Grantham Gas Company.—The Directors of the Grantham Gas Company reported at the meeting last week that, notwithstanding the continuance of the stringent restrictions as to lighting, the consumption of gas had been well maintained, owing to the large quantity now consumed for heating and cooking purposes. The high price of coal had been partly met by the increase on the accounts for gas consumed, and there was a balance on the profit and loss account of £4863, out of which a dividend at the rate of 5 p.ct. was declared.

Gas Pressure at Doncaster.—Referring to complaints that had been made as to the pressure at which the gas was being supplied, Mr. W. Clark (the Chairman of the Gas Committee) pointed out to the Doncaster Town Council that 70 p.ct. of the men employed at the gas-works before the war had gone into the army. Although the staff was nearly normal now as to number, the substitutes were not equal to the work. It was only through the Manager (Mr. Robert Watson) and staff working every day, including Sundays and holidays, that things were kept going.



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Restrictions on Dealing in Lead.

The Minister of Munitions has issued an order, dated the 2nd inst., providing that: (1) No person shall, until further notice, purchase, sell, or, except for the purpose of carrying out a contract in writing existing prior to that date for the sale or purchase of lead, enter into any transaction or negotiation in relation to the sale or purchase of lead situated outside the United Kingdom except under the terms of a licence issued by the Minister of Munitions. (2) No person shall, until further notice, purchase or take delivery of any lead situated in the United Kingdom, except under the terms of a licence issued by the Minister of Munitions, or sell, supply, or deliver any such lead to any person other than the holder of such a licence. Provided that no such licence shall be required in the case of any sale, purchase, or delivery of such lead (*a*) for the purpose of a contract or order for the time being in existence certified to be within Classes "A" or "B" of Circular L33 as to Control of Output issued by the Minister of Munitions on March 31, 1916, where the price paid upon such sale or purchase does not in the case of virgin pig lead exceed £29 per ton net and in the case of remelted lead, or old or scrap lead, exceed £26 per ton net; (*b*) for the purpose of necessary repairs or renewals involving the use of not exceeding 1 cwt. of such lead.

Consumption at Walker and Wallsend.

Addressing the shareholders at the annual meeting of the Walker and Wallsend Union Gas Company, the Chairman (Mr. C. J. Potter) stated that the gas sales showed a slight decrease of 1·16 p.ct., which was regarded as very satisfactory. He alluded to the hardship imposed upon the shareholders in sliding-scale companies at the present time, by way of reductions in dividends owing to the increase in the price of gas. The cost of material and labour had advanced so much that many gas companies and corporations had again this year been obliged to increase the price of gas to their customers—an unnecessary action with their Company this year, he was glad to say. In their case each 1d. increase in the price of gas meant a reduction of ½ p.ct. in the dividend of the shareholders, and signs were not wanting that further advance in the cost of material and labour charges would continue in the future, which would tend further to reduce the now comparatively low return. It seemed to him, therefore, only fair and reasonable that something should be done—that gas companies working under the operation of the sliding-scale should in some measure seek protection by making, at least, a united endeavour to secure powers to pay, irrespective of the price of gas, the pre-war dividend, by suspending the provisions of the sliding-scale for the time being. The report [*ante*, p. 264] was adopted; and the dividends recommended were declared.

At their meeting last Friday week, the Elland-cum-Greetland Gas Company decided to increase their investment in the War Loan from £5000 to £11,000.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Feb. 7.]

No. 1396-1777.

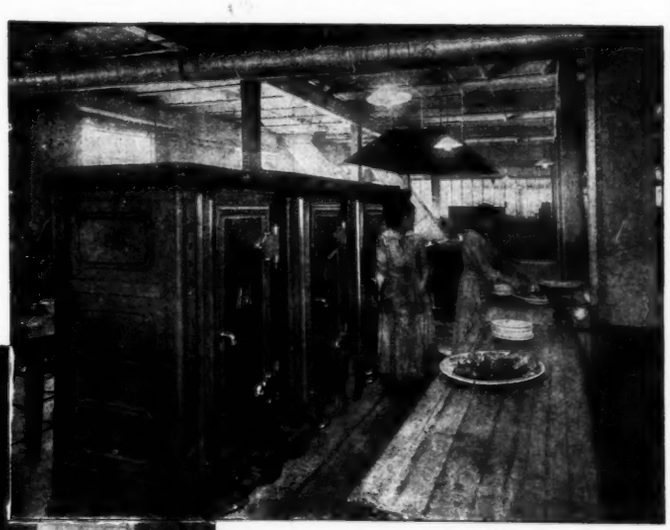
BLAIR, J. B.—"Incombustible fuel for gas-fires." No. 1556.
BOARD OF TRADE.—"Manufacture of a compound of zirconium, and its application in the production of pure zirconia." No. 1440.
DRAKE, W. A., AND DRAKES, LTD.—"Regenerative retort-settings." No. 1534.
GLAZEBROOK, R. T.—See Board of Trade. No. 1440.
GOVER, H. C.—"Apparatus in connection with gas, &c., stoves, for producing steam." No. 1724.
PARKER, J. F.—"Gas cooking-stoves." No. 1600.
RODD, E. H.—See Board of Trade. No. 1440.
ROSENHAIN, W.—See Board of Trade. No. 1440.
ROUDY, C.—"Regenerating apparatus for furnaces." No. 1461.
SHAW, J.—"Atmospheric gas-burners." No. 1464.
SKELTON, T.—"Gas-mantle." No. 1625.
SUTTON, C. J.—"Boxes for mantles." No. 1472.
TRÉFILERIES ET LAMINOIRES DU HAVRE.—See Roudy. No. 1461.
WOODWARD, H. S.—"Smoke-shades for gas-burners." No. 1397.

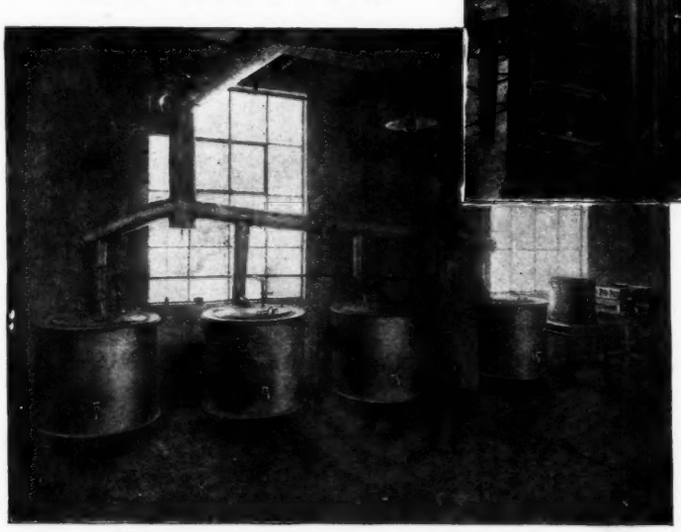
Malton Gas Company.—The half-yearly meeting of the Malton (Yorks.) Gas Company was held last Wednesday, under the chairmanship of Mr. H. W. Pearson. It was reported that, though the cost of labour and materials had increased 100 p.ct., the Company had only increased the price of gas 20 p.ct. A dividend of 5 p.ct. for the half year, free of tax, was declared.

Lighter Pennies.—Persons who have compared the 1917 coinage with that of earlier years, say that the new penny looks thinner and is lighter than the pre-war penny. According to a paragraph that has been going the round of the papers, the 1914-16 issues were foundto be in numerous instances too thick to be used in penny-in-the-slct gas-meters, very often blocking them up, and causing great inconvenience to consumers.

Frost Interferes with Gas Supply.—Cleckheaton, the chief of the three townships which together form Spenborough, in Yorkshire, was without gas from noon to about 5 o'clock on Wednesday last, owing to the effect of frost on a large gasholder at the Moorend works. The frost had bound the water-lute between the upper and lower parts of the holder, so that the telescopic movement was impossible. The hold of the frost was, however, not equal all round; and there was danger of a tilt. To avoid further danger by the depletion of the holder of gas, the town supply was stopped; and steam road-rollers were requisitioned, to turn on a jet of steam. These, with a steam-pipe from the gas-works boiler, all got to work, and quickly thawed the ice.

ARDEN HILL'S
Gas-heated
COOKING, HEATING, & HOT-WATER APPARATUS





FOR CANTEENS, HOSPITALS, &c.

New fully illustrated List now ready. — Write to

ARDEN HILL & CO.,
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A Croydon Gas Tragedy.—On being told last Friday by neighbours that no one had been heard stirring at a newsagent's shop in Croydon, the police broke into the premises, and found the occupier, Thomas Wheedon, his wife, and his son dead in a bedroom. The windows, doors, and fireplace had been blocked up, and two gas-taps turned on. A dead dog was also in the room.

Gas Appliance Rental Charges at Tottenham.—The Tottenham District Light, Heat, and Power Company have given notice to consumers that the rental of all their gas appliances except meters is to be increased by approximately 25 p.ct. The matter forms the subject of a question which Major Newman is putting to the President of the Board of Trade in the House of Commons.

STOCK MARKET REPORT.

THE Stock Exchange had another quiet period last week; business being very slack pretty generally all round and for the most part devoid of interest, save here and there when a market was touched by some special incident. The War Loan still dominates all; but hopes and expectations are indulged in by members that when the loan subscription lists are finally closed the House may resume its normal activity. This will come in time, no doubt; but a little patience will have to be exercised, as there will not be a plethora of money awaiting investment in Capel Court. As to the result of the loan, forecasts are becoming more optimistic, though it still seems doubtful whether the Government have got in touch with the "people," and enabled them to understand the unfamiliar terms of a prospectus.

In the gilt-edged market, the tone was only moderate. The 4½ per cent. War Loan was steady; but corporation issues were lowered generally. Home Rails were in good demand until Friday, when a check was dealt by the Underground's unsatisfactory results. The Foreign Market was quiet and dull for the most; but Japanese still found buyers. Americans opened more promising, but soon suffered a reaction from which they did not recover. Argentines and South Africans were very quiet and dull. In the Miscellaneous Market, movements as a rule were adverse. Rubber and Textiles were heavy, and the tendency in Banks was decidedly easier. Shipping values also receded; but it did not appear that this feature was attributable to nervousness regarding the German submarine menace.

Business in the Gas Market was much upon a level with that of the week before in point of volume, and bargain-prices, too, as a general rule, showed hardly any variation from the figures of that period. The companies' accounts for the half year do not seem to have moved the market. The Money Market was extremely easy, and some expected the Bank rate might be lowered; but the Directors thought otherwise.

Bargains done for cash during the week were as follows: On Monday, Bombay 4⅜, British 34⅜, Commercial debenture 52½, Gas Light ordinary 71⅜, 72½, ditto preference 69⅜, 70, 70½, Imperial Continental 73½, 73⅝, 74½, Wimbledon 90, 90⅜. On Tuesday, Bombay 4 13/16, Gas Light ordinary 71⅜, 72, ditto preference 70½, ditto debenture 54⅜, 55, Imperial Continental 73½, Primitiva preference 60s., ditto debenture 79⅜, 79½, South Metropolitan 77, 77½, 78, 78½. On Wednesday, British 34, Commercial 3½ p.ct. 69, Gas Light ordinary 72½, 72⅝, ditto maximum 56½, 56⅝, 56⅝, Hornsey 127⅛, 128¼, Imperial Continental 73, Liverpool debenture 71⅛, Monte Video 8, Primitiva preference 61s., South Metropolitan 78, 78¼. On Thursday, Bombay 4 13/16, Gas Light ordinary 71½, 72, 72⅜, 72½, ditto debenture 55, Hornsey 127⅛, 128¼, Imperial Continental 72, ditto debenture 60, Primitiva preference 58s. 9d., South Metropolitan 77¼, ditto debenture 55. On Friday, Gas Light ordinary 71⅜, 72⅜, ditto preference 69⅜, Monte Video 8, 8¼, Melbourne 97½, Primitiva preference 60s., 60s. 7½d., ditto debenture 79⅜, 79½, South Metropolitan 77¼, 78. On Saturday, Gas Light ordinary 71½, 71¾, 72, ditto debenture 54⅜, Imperial Continental 72, Primitiva 40s., 40s. 4½d., ditto preference 60s., 60s. 7½d., South Metropolitan 77½, 78.

The Bank rate is 5½ p.ct., as fixed on the 18th of January.

ANTE-WAR PRICES AND DIVIDENDS, LATEST DIVIDENDS, AND LAST WEEK'S BARGAINS.

Issue.	Share.	When ex-Dividend.	Previous Div or Dividend and Bonus.	Last Dividend.	NAME.	Closing Prices. July 30, 1914.	Present Prices.	Lowest and Highest Prices of Bargains.
£			p.c.					
175,472	Stk.	Mar. 10	4	4%	Aldershot 4 p.c. Pref.	..	65—70	..
1,551,868	,,	April 8	2½	5⅛%	Alliance & Dublin Ord.	59—64	62—64	..
374,000	,,	July 10	4	4%	Do. 4 p.c. Deb.	76—79	58—63	..
280,000	5	April 29	7½	4/6	Bombay, Ltd.	5⅜—5½	4⅜—5	4 13/16—4 13/16
50,000	10	Feb. 26	16	15/-	Bournemouth Gas and Water (10 p.c. / B 7 p.c. / Pref. 6 p.c. / 4 p.c. Deb.)	25—30	25—27	..
333,110	10	,,	7	7/-		15—15½	11—11½	..
115,000	10	,,	6	6/-		13½—14	9½—10	..
159,740	—	—	—	4%		..	71—73	..
992,045	Stk.	Feb. 26	†14	55/-	Brentford A Consolid.	261—266	85—87	..
734,920	,,	,,	†11	53/9	Do. B New	204—209	82—84	..
55,000	,,	,,	5	5%	Do. 5 p.c. Pref.	109—111	85—90	..
221,400	,,	June 11	4	4%	Do. 4 p.c. Deb.	91—93	67—69	..
217,380	,,	Feb. 26	11	10½%	Brighton & Hove Orig.	208—213	160—165	..
244,300	,,	,,	8	7½%	Do. A Ord. Stk.	154—159	115—120	..
530,000	20	Mar. 26	12½	22/6	British	44—45	34—35	34—34⅛
120,000	Stk.	June 26	4	4%	Do. 4 p.c. Deb. Stk.	88—90	66—68	..
245,771	,,	,,	4	4%	Buenos Ayres 4 p.c. Deb.	85—87	58—63	..
100,000	10	—	—	—	Cape Town & Dis., Ltd.	1½—2½	1½—1⅞	..
100,000	10	—	—	4½%	Do. 4½ p.c. Pref.	4—6	4½—5	..
100,000	Stk.	June 26	4½	4½%	Do. 4½ p.c. Deb. Stk.	70—75	58—63	..
157,150	,,	Feb. 26	5	5%	Chester 5 p.c. Ord.	108—110	82—83	..
1,513,280	,,	Feb. 12	5/9/4	49/4	Commercial 4 p.c. Stk.	106—108	73—75	..
560 000	,,	,,	5½	46/8	Do. 3½ p.c. do.	103—105	68—70	69
475,000	,,	June 11	3	3%	Do. 3 p.c. Deb. Stk.	69½—71½	52—54	52½
800,000	,,	,,	4	—	Continental Union Ltd.	76—79	36—38	..
200,000	,,	,,	7	—	Do. 7 p.c. Pref.	115—118	58—60	..
278,400	,,	,,	—	11½%	Croydon B and C 7 p.c.	..	175—185	..
—	—	—	—	10%	Do. E	..	..	..
492,270	Stk.	—	6	5½%	Derby Con. Stk.	123—125	100—105	..
55.000	,,	—	4	4%	Do. Deb. Stk.	102—104	80—83	..
1,032,180	10	July 29	10	7/6	European, Ltd.	17½—18	9—10	..
16,313 430	Stk.	Feb. 10	4/17/4	42/-	Gas Light and Coke (4 p.c. Ord. / 3½ p.c. max. / 4 p.c. Con. Pref. / 3 p.c. Con. Deb. / 10 p.c. Bonds)	98—102	71—78	71½—72½
2,600.000	,,	,,	3½	3½%		76—79	55—58	56½—56⅝
4,062,235	,,	,,	4	4%		96—99	69—71	69⅝—70½
4,674 850	,,	June 11	3	3%		72½—74½	54—56	54½—55
130,000	,,	,,	10	10%		..	..	..
2 8,740	,,	Mar. 12	5	4½%	Hastings & St. L. 3½ p.c.	87—89	78—83	..
70,003	10	April 29	11	6%	Hongkong & China, Ltd.	16½—16¾	8—9	..
86,600	—	—	—	9½%	Hornsey 7 p.c.	..	125—135	127½—128½
131,000	Stk.	Mar. 12	7½	7½%	Ilford A and C.	151—154	105—110	..
65,780	,,	,,	6½	5½%	Do. B	115—118	82—87	..
65.500	,,	June 26	4	4%	Do. 4 p.c. Deb.	92—94	71—74	..
4,910,000	,,	May 14	9	4½%	Imperial Continental	150—160	72—77	72—74½
1,235,000	,,	Feb. 12	3½	3½%	Do. 3½ p.c. Deb. Red.	84—86	58—61*	60
235,242	,,	Mar. 12	6½	6½%	Lea Bridge Ord. 5 p.c.	119—121	87—92	..
2,498,905	,,	Feb. 26	10	5%	Liverpool 5 p.c. Ord. (A / B)	211—213 / 146—148	84—86	..
306,083	,,	June 26	4	4%	Do. 4 p.c. Pr. Deb. Stk.	..	72—74*	71½
75,000	5	June 11	6	2/-	Malta & Mediterranean	4½—4⅝	3¾—4¼	..
250,000	100	April 1	4½	4½%	Met. of Melbourne 4½ p.c. Deb.	99—101	89—93	97½
541,920	20	May 28	4	6/-	Monte Video, Ltd.	11½—12	8—8½	8—8½
1,875,892	Stk.	July 29	4½	4½%	Newcastle&Gatsh'd Con.	99½—99½	74½—75½	..
529,705	,,	June 26	3½	3½%	Do. 3½ p.c. Deb.	82—83	73—75	..
55,940	10	Feb. 26	7/14/0	7/8/-	North Middlesex 7 p.c.	14—15	10½—11½	..
300,000	Stk.	May 14	8	8%	Oriental, Ltd.	117—122	104—106	..
60,000	5	Mar. 26	10	1/-	Ottoman, Ltd.	7½—7¾	2—3	..
60,000	50	Feb. 26	13	12½%	Portsea, Island B	128—131	95—100	..
100,000	50	,,	12	11%	Do. C	118—121	88—93	..
52,000	50	,,	10	9%	Do. D	..	..	..
249,980	5	April 29	8	—	Primitiva Ord.	5½—6	1⅞—2½	40/.—40/4½
499,960	5	June 26	5	2/6	Do. 5 p.c. Pref.	4¾—5	55/.—65/-	58 9—60/7½
521,600	100	June 2	4	4%	Do. 4 p.c. Deb.	91—93	78—80	79⅜—79½
—	—	—	—	4%	Do. ,, ,, 1911	..	..	..
346,198	Stk.	June 26	4	4%	River Plate 4 p.c. Deb.	85—87	61—67	..
150,000	10	May 14	6	6/-	San Paulo (6 p.c. Pref. / 5 p.c. Deb.)	10½—11	8—8½	..
125,000	50	July 1	5	5%		47—49	42—44	..
135,000	Stk.	Mar. 12	10	10%	Sheffield A	223—224	188—192	..
209,984	,,	,,	10	10%	Do. B	223—224	188—192	..
523 500	,,	,,	10	10%	Do. C	220—222	188—190	..
90,000	10	May 28	9	6/-	South African	10½—11½	..	..
6,609,895	Stk.	Feb. 10	5/4/0	46/8‡	South Met. 4 p.c. Ord.	111—113	77—79	77—78½
1,895,445	,,	July 10	3	3%	Do. 3 p.c. Deb.	72½—74½	54—56	55
224,820	,,	Feb. 26	8½	8%	South Shields Con. Stk.	157—159	144—146	..
952,795	,,	,,	6	48/4	S'th Suburb'n Ord. 5 p.c.	114—116	80—82	..
60,000	,,	,,	5	5%	Do. 5 p.c. Pref.	110—112	79—81	..
135,000	,,	—	—	48/4	Do. West Kent	..	..	..
187,558	Stk.	June 26	5	5%	Do. 5 p.c. Deb. Stk.	116—118	88—90	..
647,740	,,	May 14	5	5%	Southampton Ord.	99—102	77—79	..
120,000	,,	Feb. 12	7½	7½%	Tottenham (A 5 p.c. / B 3½ p.c. / District 4 p.c. Deb.)	135—138	120—123	..
782,275	,,	,,	6	5⅝%		115—117	89—91	..
181.255	,,	June 26	4	4%		87—89	65—67	..
182 380	10	Dec. 30	5	—	Tuscan, Ltd.	5—6	1—2	..
149,900	10	July 1	5	5%	Do. 5 p.c. Deb. Red.	93—95	60—65	..
236,476	Stk.	Mar. 12	5	5%	Tynemouth 5 p.c. max.	108½—109½	91—92	..
					Wandsworth, Wimbledon, and Epsom—			..
30,000	,,	Feb. 26	8⅜	78/9	Wandsworth A 5 p.c.	151—156	117—122	..
255 636	,,	,,	6¼	63/9	Do. B 3½ p.c.	129—134	101—103	..
108,075	,,	,,	5/17/3	55/11½	Do. C 3½ p.c.	110—115	88—93	..
352,000	,,	,,	6¼	57/6	Wimbledon 5 p.c.	117—122	90—95	..
98,000	,,	,,	6¼	63/9	Epsom 5 p.c.	121—126	98—103	..
88,416	,,	June 26	3	3%	3 p.c. Deb. Stk.	66—69	51—54	..

* Ex. div. † Paid on Old 10 p.c. and 7 p.c. Standard Stocks. ‡ Next dividend will be at this rate.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

JUNIOR DRAUGHTSMAN. Saltley Gas-Works.
CLERK. Sheerness Gas Company.
STOKERS. Fleetwood Gas-Works.

Appointment Wanted.

TRAVELLER. Lee, 7, Spurstowe Road, London, N.E.

Plant, &c. (Second Hand), for Sale.

EXHAUSTERS, HYDRAULIC MAIN, &c. Broadstairs Gas Company.
GOVERNORS AND HYDRAULIC MAIN. Tipton Gas-Works.

Plant, &c. (Second Hand), Wanted.

GAS ENGINE AND SUCTION PRODUCER. Cramp and Frith, Manchester.

Gas and Coke Works for Sale.

BUILTH WELLS GAS AND COKE WORKS.

Meetings.

HORNSEY GAS COMPANY. No. 5, Great Winchester Street, March 2. 3.30 o'clock.

TENDERS FOR

Cookers, &c.
PLYMOUTH GAS DEPARTMENT. Tenders by Feb. 23.

Meters.
PLYMOUTH GAS DEPARTMENT. Tenders by Feb. 23.

Lighting Goods, &c.
PLYMOUTH GAS DEPARTMENT. Tenders by Feb. 23.

Pipes, Lead, and Brass Goods.
PLYMOUTH GAS DEPARTMENT. Tenders by Feb. 23.

Tar and Liquor.
HAWORTH URBAN DISTRICT COUNCIL. Tenders by Feb. 24.